NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

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Novell gets a hot new ally in Powersoft

By Wayne Eckerson
Senior Editor

SANTA CLARA, Calif. — Heeding customer demands, Powersoft Corp. and Novell, Inc. this week will announce a tool that will make it easier for developers to build client/server applications that run on Novell NetWare local-area networks.

PowerBuilder Library for NetWare will enable programmers to build application hooks into about 25 NetWare print, directory and communications services by pointing and clicking a mouse on Windows-based objects. Currently, users of PowerBuilder — the firm's popular client/server development tool — have to code calls in C or PowerBuilder's Powerscript programming language to provide access to NetWare services.

In addition, Powersoft said it is beta-testing interfaces that would give applications developed using PowerBuilder access to Novell's Btrieve and NetWare SQL databases.

"Our customers were pushing us to simplify the process of accessing NetWare services from PowerBuilder," said Bill Critch, Powersoft director of business

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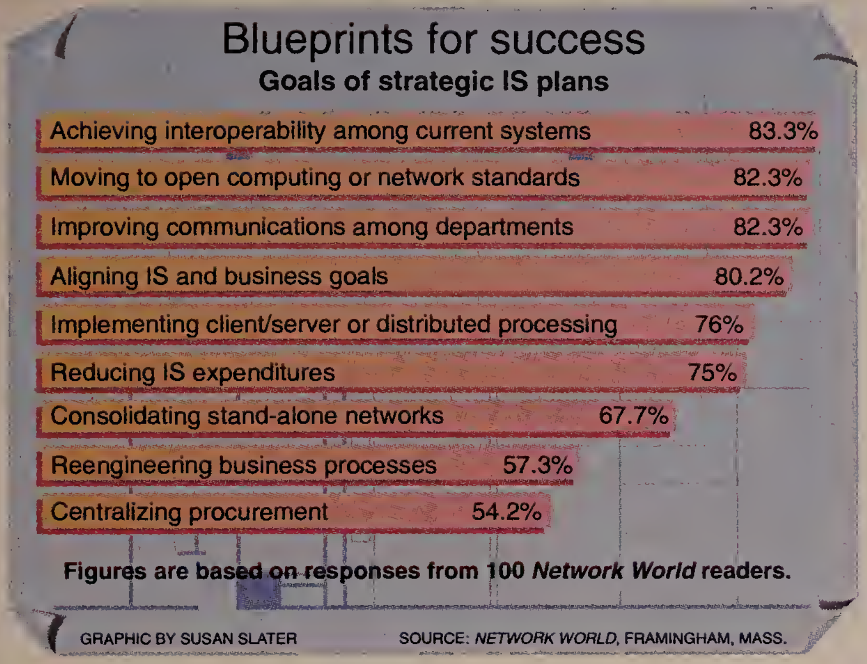
Blueprints for success

Goals of strategic IS plans

Figures are based on responses from 100 *Network World* readers.

GRAPHIC BY SUSAN SLATER SOURCE: *NETWORK WORLD*, FRAMINGHAM, MASS.

Failing to plan could be a sure plan for failure

By Joanne Cummings
Senior Writer

NETWORK WORLD'S R.A.F. READER ADVOCACY FORCE

What would you give for something that can help you integrate your disparate networks, provide interoperability among systems, develop new applications tailored to business goals and streamline operations?

Well, there is something that can help you do all that and more — it's called strategic planning.

The thought of strategic planning elicits groans from many a technology executive. It can be a painful process that exposes political problems within a company and throws light on business and information systems (IS) flaws. It requires time and commitment.

Like exercise, strategic planning is more talked about than done. Too few companies have long-term IS plans and procurement policies designed to help them achieve strategic goals.

Too bad. Analysts, users and others agree that strategic planning is the one tool that will separate the winners in the IS game

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Eicon to ease remote site net headaches

Three-in-one tool promises to save users money linking remote sites to SNA, LAN internetworks.

By Michael Cooney
Senior Editor

MONTREAL — Eicon Technology Corp. is preparing to announce an innovative software-based router/gateway that provides an inexpensive way to ship multiprotocol traffic from remote sites to corporate SNA or TCP/IP backbones.

Scheduled to be announced at INTEROP 93 Spring, Eicon's InterConnect Server (ICS) will run on a variety of LAN platforms, from Novell, Inc.'s NetWare and IBM's OS/2 to Unix and Microsoft Corp.'s Windows NT.

The software handles the work of three separate products — a multiprotocol router, a Systems Network Architecture gateway and a Synchronous Data Link Control protocol conversion device — at a price of no more than $5,000. That can mean big savings for users with many remote offices, said Lionel Gibbons, product-line manager for the ICS.

For example, a comparable low-end feeder router is IBM's software-based RouteXpander/2, which costs $795 and requires a $795 Wide Area Adapter card. A Netlink, Inc. SDLC Link Server, which converts SDLC to the local-area network-compatible Logical Link Control 2 (LLC2) protocol, costs at least $7,000. SNA gateways range from $1,000 to more than $10,000.

"Eicon has built a model for

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Users take to outsourcing pieces of the network operations pie. Page 34.

AT&T boosts support for virtual nets

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week announced three new service and support offerings for customers of its flagship Software-Defined Network service — offerings that SDN users said are long overdue.

Through the services, AT&T will coordinate maintenance with customer premises equipment vendors and help users with network monitoring, design and analysis.

"We've been pushing hard for these services for years," said Barry Volante, manager of telecommunications planning for General Electric Co., one of AT&T's first and largest SDN users. "They should've been offered as standard features since Day One."

Still, AT&T has upped the ante for virtual network service pro-

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NETLINE

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AS/400 PACKAGED with client/server programs. Page 2.

AT&T TO REDUCE T-1 local access channel charges, increase other charges. Page 4.

SPRINT WILL BUILD dedicated transaction processing net. Page 4.

FIBERMUX ADDS ATM HUB products. Page 4.

CLIENT/SERVER TAKING root but with more work than expected, survey says. Page 4.

CARRIER WARNS FCC that 800-portability advantage may be squandered. Page 5.

NEWSPAPER

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Tests of 6611 validate IBM claims but raise concerns

By Steve Simon
Special to Network World

Tests conducted by The Travelers Corp. on the 6611 multiprotocol router confirm IBM's claims about rich features but also raise questions about the product's readiness for the company's large, traffic-intensive IBM network.

The Travelers

The Travelers' internal testing results make a strong case for using the 6611, particularly because some of its features and functions outshine those found in other routers. However, while the 6611 provides strong performance for routable protocols such as the Internet Protocol, it falls short of offering the full performance necessary for supporting Systems Network Architecture and Network Basic I/O System traffic over a T-1 net.

Network managers should also note that the 6611's lack of hardware redundancy looms as an issue because a single component failure could cripple the router.

Competitive with other routers, the 6611 provides cost savings by allowing IBM protocols

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NetFrame readies line of client/server superservers

Use of plug-in dedicated processors improves performance, supports multiple environments.

By Bob Brown
Senior Editor

MILPITAS, Calif. — NetFrame Systems, Inc. this week will unveil a new line of local-area network superservers optimized to run client/server applications.

NetFrame's Client/Server Systems provide high-performance application processing by running programs on dedicated, plug-in processor boards. Existing NetFrame servers run applications on the same central system processor used to support the network operating system kernel.

The new servers are designed to run multiple Novell, Inc. NetWare Loadable Module-based applications, such as Oracle Corp. and Sybase, Inc. databases, but it eventually will be enhanced to support applications running on Univel's UnixWare and Microsoft Corp.'s Windows NT. This will give users the option of running multiple operating systems on a single server.

"NetFrame has found a way to apply processing power in an appropriate, balanced fashion," said Lynn Berg, program director for mid-range computing strategies at Stamford, Conn., market

(continued on page 6)

Medical imaging firm finds SMDS better deal than T-1

Will make it cheaper to add new sites to network.

By Bob Wallace
Senior Editor

MINNEAPOLIS — For roughly the same price as a star topology private T-1 net, the Center for Diagnostic Imaging (CDI) here is getting the mesh networking features of a Switched Multimegabit Data Service (SMDS) net.

CDI, US West Communications, Inc.'s first paying SMDS customer, is using the nascent switched data service to support image transmission between three clinics and its corporate headquarters here.

For $14 more a month than the T-1 configuration, CDI gets unlimited use of its 1.17M bit/sec SMDS net. And CDI can add sites to its SMDS for less than it would cost to add sites to the T-1 net it evaluated.

"In the long run, CDI will be a big winner," said Scott Lucas, president of Lucas Technologies, an Eden Prairie, Minn., consultancy that conducted the cost-justification of SMDS for CDI. "They'll use it to change the way they do business by adding business partners to the net."

SMDS, unlike frame relay, was conceived as an intercompany offering that would enable firms

(continued on page 54)

IBM expands AS/400 mgmt. and client/server support

By Michael Cooney
Senior Editor

NEW YORK — IBM last week announced a variety of products designed to ease management of AS/400 nets and position the minicomputer at the heart of client/server applications.

As expected, IBM announced the Application System/400 Client and Server Series of prepackaged client/server applications and systems, rolled out a systems management platform for the minicomputer and boosted the power of the box by announcing AS/400 F series models that are an average of 26% faster than the existing E series.

The company also promised future network improvements, such as support for high-speed local-area networks and enhanced Transmission Control Protocol/Internet Protocol capabilities.

To boost the AS/400's role in managing distributed networks, IBM and Candle Corp., Big Blue's management system development partner, rolled out the first comprehensive systems management platform for the AS/400.

Automation Center/400 consists of three components — Omegamon/400, OmegaView/

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Briefs

FDDI copper standard in home stretch. With the adoption of a voltage level at last week's ANSI meeting in Austin, Texas, it appears the last hurdle has been cleared in the effort to finalize a standard for running Fiber Distributed Data Interface over copper wiring. By agreeing on a 2.0 voltage level for unshielded twisted-pair wiring that meets Federal Communications Commission emission requirements, ANSI has now put the three major issues surrounding the standard — encoding, scrambling and signaling — to rest, freeing up silicon vendors to develop chips that conform to the draft standard.

Expanding one-way wireless messaging. Motorola, Inc. and AT&T EasyLink Services last week announced creation of an X.400 link between Motorola's EMBARC one-way wireless messaging service and AT&T EasyLink Service's public E-mail service. The connection will enable AT&T Mail users to send messages to users of Electronic Mail Broadcast to a Remote Computers.

IBM to beef up Info Warehouse. IBM has scheduled a press briefing for March 16 at which it is expected to announce database and decision support tools that will bolster its Information Warehouse architecture. Although IBM declined to comment, but analysts speculate the company will announce Release 3 of its DB2 relational database management system that will run on distributed platforms — including OS/2 workstations and AIX-based servers — and act as an enterprisewide data repository.

Noted Notes notes. Lotus Development Corp. last week wracked up a couple of multimillion-dollar Notes contracts with European firms. Consumer product giant Unilever said it is standardizing on Lotus Notes to enhance information sharing among its employees worldwide and will purchase between 10,000 and 30,000 copies of the $495 Notes. Statoil, a large Norwegian firm, signed a four-year agreement to purchase Notes and other Lotus software for its 14,000 employees.

Ameritech launches LAN link service. Ameritech last week announced Ameritech LAN Interconnect Service (ALIS), an offering that enables users to link Ethernet or token-ring local-area networks in six major metropolitan areas: Chicago, Cleveland and Columbus, Ohio; Detroit; Indianapolis; and Milwaukee. Customers can use ALIS to connect up to eight LANs of the same type and speed.

Microsoft bags DOS 6.0 net features. Microsoft Corp. has removed features from DOS 6.0 that let users share personal computer resources and exchange electronic mail for fear they would cause confusion with users who already have networks, according to a letter accompanying the latest beta release. Microsoft recently released Workgroup Connection, a DOS add-on that provides similar capabilities for DOS users connected to networks running Windows for Workgroups, the letter noted.

Cellular carriers band together. A group of 14 U.S.-based cellular carriers plus the 15-member Canadian consortium called Mobile Canada announced they will provide an improved version of cellular service by the third quarter. Subscribers of MobiLink will have 24-hour customer service, a customer satisfaction guarantee, and uniform dialing and access codes for receiving calls in major metropolitan areas while roaming outside the carrier's cellular area.

CONTACTS

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AT&T revising T-1 service rates, pending FCC approval

Changes will increase total service cost slightly.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week proposed a reduction of local access channel prices for its T-1 service while asking for increases in multiplexing and access connection charges.

AT&T wants to cut local access channel charges by 5% and boost access connection fees for switched and dedicated services by 31% and 48%, respectively. Central office multiplexing charges would rise by 33%.

Local access channel charges are fees assessed for dedicated access. Access connection is the cost of the physical connection of an access link to an AT&T point of presence.

According to Hemant Vaidya, division manager for AT&T's Accunet High Capacity Services, the end result of the changes for AT&T T-1 customers will be an increase of about 2% of total T-1 service charges.

The carrier said the local channel revisions bring the cost of AT&T-provided access more in line with fees for access that users acquire directly from local telephone companies and increase the attractiveness of end-to-end circuit provision by AT&T.

But analysts say users will not find the increases in mux and access connections attractive.

Under AT&T's plan, access connection charges for switched services will rise from $210 to $310 a month — a 48% increase — while charges for dedicated service will increase from $160 to $210 a month — a 31% increase. Access connection charges are assessed at each termination of an end-to-end link.

If the carrier's plan is approved, AT&T customers will also pay far more for central office-based multiplexing, which will increase from $150 to $200 a month per each T-1.

"They're nickeling and diming users to death," said Michael Hills, president of HTL TeleManagement, Inc., a Burtonsville, Md., tariff analysis and network design firm.

M24 central office-based multiplexing takes incoming traffic and splits it out to AT&T voice and data services such as Software-Defined Network, fractional T-1 and 800.

AT&T's Vaidya said the increases represent the final phase of price adjustments initiated last October "to better reflect the market value of services provided to customers." The carrier revamped its entire private-line pricing structure in August 1992.

The price revisions are scheduled to take effect Feb. 26, pending Federal Communications Commission approval. ◘

Sprint offers dedicated net for transaction processing

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Sprint Communications Corp. last week said it will build a dedicated network to support transaction processing services targeted to users such as retailers, banks and credit card companies.

The TranXact net will give point-of-sale devices at department stores, gas stations and other retail sites access to processors at a transaction processing company for applications such as credit card authorizations.

TranXact will be an overlay network riding on top of Sprint's fiber backbone net. It will be anchored by TP 4900 packet switches with front-end controllers from Primary Access, Inc.

Sprint, which claims to serve seven of the 10 largest U.S. credit card authorization firms, already provides transaction processing services over its X.25 packet net.

The problem, according to Sprint officials, is that for low-volume retail locations, leased-line access to the network cannot be cost-justified. The typical response time for sites with switched access averages 20 seconds, too long for many applications, said Dominick DeAngelo, vice president of product management at Sprint Data Group.

With TranXact, response time should be cut to between 10 and 12 seconds. Sprint has made several network enhancements to accomplish this performance improvement, DeAngelo said.

John Chay, a consultant with American Creative Enterprises in Portland, Pa., said if Sprint lives

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Fibermux aims ATM arrow at Crossbow intelligent hub

By Skip MacAskill
Staff Writer

CHATSWORTH, Calif. — Joining a growing list of hub vendors prepping ATM products, Fibermux Corp. last week announced plans to roll out this summer a suite of Asynchronous Transfer Mode products for its intelligent hub.

The products include an ATM backplane for the hub, a modular ATM switch, an ATM I/O module, and redesigned token-ring and Ethernet modules that convert packets into ATM cells. The products represent the first hardware platforms of the company's ATM strategy, dubbed ATMosphere, which was announced last year ("Fibermux announces its ATM development strategy," *NW,* June 22, 1992).

Unlike rivals such as Cabletron Systems, Inc. and SynOptics Communications, Inc., which will initially offer stand-alone ATM switches and later add port ATM functionality to their hubs, Fibermux is integrating the technology into its CrossbowPlus hub now.

"Fibermux is leapfrogging the interim steps that other vendors are taking to provide users with hub-based ATM services," said Chip Pettirossi, a research analyst at International Data Corp., a market research firm based in Framingham, Mass. "The CrossbowPlus architecture is also designed to support ATM to the desktop, which is an advantage because it doesn't require external or nonintegrated methods."

Cabletron is reselling Fore Systems, Inc.'s stand-alone ATM switch and currently offers both workstation and hub interfaces to the device. SynOptics, which developed its own 16-port switch, is expected to demonstrate it at INTEROP 93 Spring next month and ship it in the third quarter. Fibermux will roll out its ATM products at the INTEROP 93 Fall show in August. Pricing and availability will be announced at that time.

Chief among Fibermux's new products is a 9.6G bit/sec backplane that can be added to installed 14-slot CrossbowPlus hubs to serve as a superhighway

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Client/server is maturing, but painfully

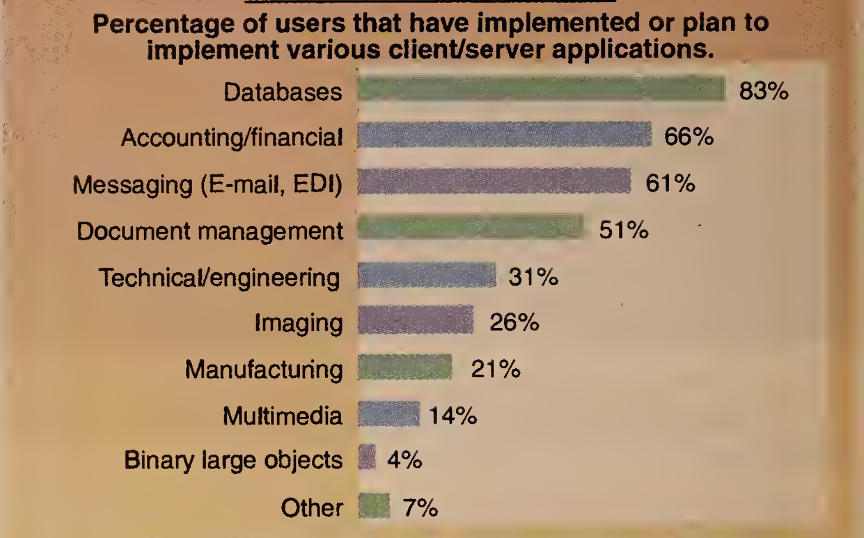
By Wayne Eckerson
Senior Editor

FRAMINGHMAM, Mass. — Client/server computing has taken root in corporate America, but companies are finding it more difficult than they expected to harvest the fruits of distributed processing.

A survey of more than 1,200 readers of *Network World, Computerworld* and *InfoWorld* conducted by International Data Group (IDG) Research Services here shows that more than half (57%) the readers have already implemented client/server applications and almost three-quarters (73%) will do so by 1994.

Client/server targets

Percentage of users that have implemented or plan to implement various client/server applications.



Based on a survey of 1,251 *Network World, Computerworld* and *InfoWorld* readers.

GRAPHIC BY TERRI MITCHELL

SOURCE: INTERNATIONAL DATA GROUP RESEARCH SERVICES, FRAMINGHAM, MASS.

Despite the mass migration to client/server computing, users are encountering a variety of problems that are undermining potential cost-savings and hampering their efforts to roll out client/server applications on an enterprisewide scale.

Chief among their complaints is the lack of administrative and support tools for managing client/server implementations and the dearth of workers with expertise in this area. They also mentioned the high cost of rolling out client/server applications, the difficulty of integrating client/server applications with legacy systems and the challenges of troubleshooting multivendor environments.

"It's been a rude awakening," said Michael Lutz, director of technology management at PHH Fleet America in Hunt Valley, Md. Lutz was recently assigned to resuscitate a core business application that was developed in a client/server model but has poor response time and crashes repeatedly for no apparent reason.

Lutz is moving the high-volume, client/server application to a more robust local-area network operating system and replacing the operating system of its existing database server with Unix.

"I'm looking for a real production environment with all the necessary management, scheduling and administration tools," he said. "Unix is the most mature operating environment."

According to the IDG survey, many firms will be hitting the same wall as PHH when they extend the scale or scope of their client/server applications. The majority of these applications today use 386 personal computers running Windows as clients and 486 PCs as servers, the survey shows.

"The 486 servers are running out of steam," said Mark Roy, chief executive officer of NetLinks Technology, Inc., a client/server consultant and integrator in Nashua, N.H. Roy said many companies will have to upgrade their servers to Pentium machines or move to Unix.

The IDG survey confirms that users that may have piloted client/server applications within a work group or department are now aggressively extending those applications throughout the enterprise. More than two-thirds (67%) of those implementing client/server in the next two years will do so on an organi-

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> Chief among complaints is the lack of tools for managing implementations and the dearth of workers with expertise in this area.

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Intel chooses partners in ISDN, mobile game

By Ellen Messmer
Senior Correspondent

SANTA CLARA, Calif. — Intel Corp. last week announced agreements with industry partners for developing laptop and PC products that address the mobile communications and ISDN arenas.

Intel has signed a preliminary agreement to work with Ericsson GE Mobile Communications, Inc., which makes a wireless modem for the RAM Mobile Data, Inc. mobile communications network, to produce products that give Intel-based laptop computers access to RAM's network.

Although the companies were not prepared to discuss specific product plans, sources said the first device to emerge from the deal will likely be a wireless modem, based on the Ericsson design, that supports the Mobitex wireless communications standard.

Intel support for the RAM Mobile Data network would increase market visibility of the two-way wireless services, which were launched last year and will likely obtain nationwide coverage this spring. The Intel-branded products would be made available along with RAM's wireless services in over 6,000 retail outlets selling Intel-based personal computers.

"We will jointly develop not only the market, but the products that add wireless communications for laptops and portable computers," said Ake Persson, vice president of business development with Ericsson's mobile division, the first equipment maker to support the Mobitex standard.

"The integration of PCs and wireless communications is an enormous opportunity," said Frank Gill, Intel senior vice president. "With these agreements, we don't have to start from scratch."

The agreements between Intel and Ericcson are still in the formulative stages, Persson said, but a definitive agreement will be concluded soon.

Other action

Separately, Intel announced agreements with Ameritech and Bell Atlantic Corp. for development of a pair of Basic Rate Interface (BRI) Integrated Services Digital Network boards that will give PCs videoconferencing capabilities.

Bob Ingalls, director of business development at Bell Atlantic, said one of the boards would be use for telephony and the other for video capture.

"This agreement and cooperation will allow us to combine the richness of the PC and real-time communication capability of the telephone to deliver a powerful communications tool," Gill said. ☑

Lack of rules may jeopardize 800 portability

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Allnet Communication Services, Inc. last week warned the FCC in an emergency petition that it must quickly come up with rules for carriers to follow in switching 800 customers to rivals or the viability of 800 portability may be jeopardized.

Allnet asked the Federal Communications Commission to require carriers to switch users within two days of a request. Without such rules, carriers will have no incentive to quickly switch customers off their network to a rival's, Allnet told the FCC.

Allnet's concerns are based on an arrangement it has had with AT&T for the past six months that enables customers to switch to Allnet's network while still using an AT&T 800 number. Allnet officials accused AT&T of taking more than three weeks to switch users to Allnet's service in most cases.

Greg Jones, senior vice president at Allnet, said all carriers will experience the same problems with 800 portability unless the FCC acts now. Today, only voluntary procedural guidelines exist, which require "an incumbent carrier to process a carrier conversion order from an existing subscriber in a timely manner," Allnet said in its filing.

"Carriers may be able to scare people from exercising their option [to switch], or if they do exercise their option but it takes too long, customers will get frustrated and go back," Jones said.

MCI Communications Corp. and Sprint

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Aptec plans ATM support for Network Data Server

Technology boost will give workstation users high-speed access to storage, other peripherals.

By Bob Brown
Senior Editor

BEAVERTON, Ore. — Aptec Computer Systems, Inc. is adding Asynchronous Transfer Mode (ATM) capabilities to its data access servers to give power workstation users high-speed connections to tape drives and other peripherals.

Company officials said Aptec will provide users with access to storage devices and peripherals via direct ATM connections from the Aptec Network Data Server and through links to other vendors' ATM switches.

Initially, the ATM upgrade will be pitched to Aptec's installed base of engineering and research organizations, but the company plans to provide a version of its product better suited for commercial users over time as multimedia applications grow in use.

"We're addressing two issues with our ATM offering," said Dan Gatti, senior vice president of sales and marketing at Aptec. "We're providing high-speed data access and distributed storage."

Aptec's Network Data Server boasts a 1.6G bit/sec synchronous backplane bus, 1G bytes of memory and a Network File System-based file system. It enables users to provide fast, centralized access to storage and other peripherals for groups of workstation users. Unlike traditional local-area network servers, it is not designed to handle file and print services or process applications.

The Unix-based server is most popular among engineering and research organizations carrying out simulations, visualizations and other compute-intensive applications.

The Network Data Server features a parallel processing architecture that can support as many as 12 separate interface processors, each of which can handle multiple storage and network connections. Users can mix and match the ports among network and storage connections based on their needs.

The server already supports Ethernet, Fiber Distributed Data Interface and various direct connections. ATM provides the next level in high-speed connectivity.

The ATM upgrade will be available via the addition of a Motorola, Inc. 68040-based processor supporting ATM software and interfaces provided by Aptec.

Aptec plans to build interfaces between its servers and various vendors' ATM switches. Aptec officials have had discussions with officials from such companies as Fore Systems, Inc. Aptec plans to roll out beta versions this summer and will begin shipping the ATM upgrade in the fall.

The Aptec Network Data Server costs between $35,000 and $150,000, based on configuration. The ATM upgrade has not yet been priced.

Treasury to use electronic signatures

By Ellen Messmer
Senior Correspondent

ROCKVILLE, Md. — The Department of the Treasury last week unveiled plans for using digital signatures in processing tax payments, which would require the banking industry, state governments and, eventually, the individual taxpayer to adopt the public-key technology.

Henry Philcox, the Treasury Department's chief information officer, outlined six ways the Internal Revenue Service intends to electronically process tax payments and related information, all of which would require use of a digital signature for signing electronic documents. But the controversy over the government's proposed Digital Signature Standard (DSS) is casting a cloud over the Treasury Department's implementation efforts.

Under the Tax Modernization Plan, the agency would require use of DSS for things such as quarterly tax-deposit payments, wage forms and currency transaction reporting, Philcox said at the Federal Digital Signature Symposium sponsored by the National Institute of Standards and Technology (NIST) last week. These account for hundreds of millions of transactions each year.

Philcox predicted that the movement to electronic forms made possible by DSS would result in savings of about $5 billion dollars per year by eliminating paper processing and fielding phone calls. "It's [about time the] IRS got into the modern age," Philcom said. "We see this coming into play in the late 1990s."

The federal government plans to have the U.S. Postal Service of-

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Fibermux aims ATM arrow

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between the new ATM Switch and I/O modules. The backplane complements the hub's existing 300M bit/sec bus, which supports four Ethernet and as many as 14 token-ring local-area networks.

The 10-port I/O modules include models for both Ethernet and token ring. The modules have integrated segmentation and reassembly technology, allowing an Ethernet or token-ring packet to be converted into an ATM cell and transported across the new backplane to the switching module.

The ATM Switch Module, which connects directly to the new backplane, switches the cell across its gigabit-speed switching matrix and sends it, via the ATM backplane, to its destination. The cell is then converted back into the appropriate packet type on the destination module. Initially, only virtual connections between similar LANs will be allowed.

The switch module is based on a four-chip application-specific integrated circuit chipset that Fibermux jointly developed with LSI Logic Corp. Its cross-point switching architecture can support as many as 16 simultaneous virtual 200M bit/sec data paths.

Fibermux recommends using two switching modules in the hub to take full advantage of the gigabit-speed backplane. Users could also use the second switch module to back up the first.

The final piece of Fibermux's ATM plan will fall into place later this year when the company rolls out an ATM I/O module for the hub that will provide desktop connections to high-speed workstation users running bandwidth-intensive and real-time multimedia applications.

Fibermux pointed out that distributing the ATM switching capabilities throughout a hub and between hubs had some advantages over the centralized, stand-alone switch method used by other vendors.

"By distributing the switching, users can minimize the impact of failure because if they're relying on a stand-alone switch and it goes down, they've lost their entire ATM capability," said Mike Zeile, senior product-line manager for Fibermux.

Cascade to round out line with new 1.2G ATM switch

By Jim Duffy
Senior Editor

WESTFORD, Mass. — Cascade Communications Corp. this week will unveil an Asynchronous Transfer Mode (ATM) switch that allows users to employ switched services for internodal trunks and adjust packet sizes for various applications.

The Broadband-STDX 9000 (B-STDX) is a 1.2G bit/sec bus-based switch with 14 I/O slots for local- and wide-area interface modules.

The switch can support as many as 112 nonchannelized E-1 links via V.35, X.21, RS-449 and EIA-530 ports, 56 channelized T-1s, 14 T-3s or 14 45M bit/sec ATM interfaces.

(continued on page 54)

MCI to offer switched data links to U.K.

By Anita Taff
and Bob Wallace
Network World Staff

WASHINGTON, D.C. — MCI Communications Corp. last week announced plans to roll out a switched digital data service between the U.S. and the U.K. that may eventually be extended to other European countries.

The service, dubbed International Switchband, is a circuit-switched data service that will enable users to establish a link to the U.K. in conjunction with Mercury Communications, Ltd.

Paul Singh, vice president of global product marketing for MCI, said International Switchband will be offered at 256K, 384K, 512K, 768K, 1.472M and 1.920M bit/sec.

(continued on page 54)

NetFrame readies line

continued from page 2

research firm Gartner Group, Inc.

The application processors initially will be based on Intel Corp. 50-MHz 80486 processors with up to 128M bytes of memory but will support Intel's powerful Pentium chip as soon as it is available.

The introduction of the new line marks NetFrame's expansion beyond the file-sharing market it entered in the fall of 1989, said Jeff Hudson, NetFrame's vice president of sales and marketing. NetFrame's superservers are designed to provide mainframe- and minicomputer-like I/O and fault tolerance while supporting shrink-wrapped personal computer software.

"There is a special requirement to provide a server that works well in the client/server environment," Hudson said. "You need a lot of [million instructions per second] to support the application on the back end and also a lot of I/O to support all the network traffic."

NetFrame is offering four models under its Client/Server Systems series of superservers — the NF200C/S, NF250C/S, NF400C/S and NF450C/S. The NF200C/S and NF250C/S are 2-ft. systems with room to add three processors — either I/O or application. The NF400C/S and NF450C/S are 3½ feet tall and support up to eight additional processors.

The new servers support the same central system and I/O processors as NetFrame's existing server models. The major difference, however, is that users can now plug in not only additional I/O boards, but also application boards.

Application and I/O processors can be hot swapped, so if one fails, it can be replaced with another without disrupting the server. NetFrame has also developed new remote server management software but would not provide more details.

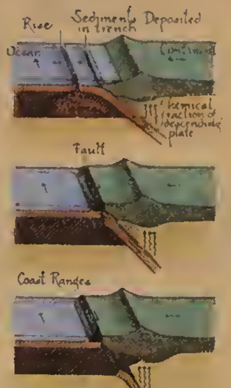
According to Hudson, the new NetFrame superservers promise to push NetFrame into competition with minicomputer and mainframe vendors pitching their computers as servers.

Brad Day, a principal analyst for server technologies at market research firm Dataquest in Framingham, Mass., applauded NetFrame for a strategy that he said is in step with where database and application developers, such as Oracle, are heading. "Oracle 7 is designed to take full advantage of this very cost-efficient, multiple, parallel processing architecture," he said.

The C/S series of superservers are available starting this week, and all existing NetFrame superservers can be upgraded to support the client/server capabilities. NetFrame officials declined to provide exact pricing but said the servers will start at less than $30,000.

Not long ago, identical fossil types were discovered in South America and Africa. A rather curious unearthing, given that the two continents are noted today for their uniquely different species. To explain this finding, the naturalist Alfred Wegener correctly proposed the idea that long before our knuckle dragging ancestors made their foray onto the planet, Earth's continents had once been a single land mass that later split apart. What we are referring to, of course, is the theory of continental drift.

Although this most fantastic of Earth's mysteries may cause alarm for some people, it doesn't trouble us in the least. Because no matter how far apart the continents may drift, N.E.T.'s enterprise networks will make certain that they all stay connected. Easily, quickly and transparently.


Rise
Sediments Deposited in trench
Ocean
Continent
Chemical fraction of descending plate
Fault
Coast Ranges

While many set out to change the world, the real movers and shakers are the tectonic plates.

200 Million Years Ago Earth's Continents Started Drifting Apart. Today, We're Working To Bring Them Back Together.

N.E.T. offers the world's widest range of networking products and technologies. Going beyond wide area networking, effectively linking local and wide area networks. And we have more ways to simplify network management, if you get our drift.

OUR PLAN TO REUNITE THE CONTINENTS.

When it comes to movement, the Earth takes its sweet time.

We, on the other hand, prefer to move at a more rapid pace. Take our new Asynchronous Transfer Mode (ATM) product, for example. Developed through our ADAPTIVE subsidiary, ATMX tears down the barriers that exist between LANs and WANs. So you can connect desktop to desktop, down the hall and around the world.

Furthermore, it gives you the power to connect high performance workgroup data networks today and the ability to add multimedia applications as you need them. That this technological accomplishment originates from N.E.T. should come as no surprise. After all, ATMX has an impressive genealogy. From the broadband, high speed networks of our STM, to the global communication capabilities of IDNX, to the internetworking capabilities of our enterprise routers and frame relay modules. Not to mention the access networking capabilities you get from our ADNX and SPX products.

We're tearing down the boundaries between LANs and WANs. Now you can connect desktop to desktop down the hall, and around the globe.

By choosing N.E.T. as your networking partner, you get an incredible range of flexible networking solutions that can meet your objectives today and carry you into the future. Saving you a tremendous amount of time and money. Perhaps that is why N.E.T. has just swept the prestigious *Data Communications* User's Choice awards for outstanding technical capability and support.

Data Comm USERS' CHOICE

WHAT GOES AROUND COMES AROUND.

It seems that networking products bridging great distances may not be required 250 million years from now.

Scientists tell us that if present movements continue, the Atlantic and Indian Oceans will close up, drawing the continents together in a single immense land mass. Fascinating. But frankly, who can wait that long?

Millions of years ago, the continents were in a single mass called Pangaea. It eventually split and formed two smaller masses, Gondwanaland and Laurasia. Further splitting brought the continents to their present position. And you thought people had a hard time staying together.

NET

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Don't let opportunity drift by. Call 1-800-388-4NET for more information.

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High-speed Smorgasbord

UDS offers more choices, more features than any other modem builder

UDS, acknowledged by leading trade magazines and independent research organizations as the world's premier supplier of V.32 and V.32 *bis* modems, offers more variations than any other manufacturer.

Among the user options available are:

PACKAGING—Board-level IBM plug-ins, standalone packages or central site rack-mountable cards.

THROUGHPUT—Selected models offer MNP® levels 4 and 5 for error control and data compression; others comply with V.42 *bis*, for throughput rates up to 57,600 bps. UNIX variations are also available.

CONNECTIVITY—Sync-Up™ board-level versions of V.32s are available for various combinations of BSC, SNA and OS/2 host-to-remote communication for EDI, X.25, BSC, SNA and LU6.2.

PC APPLICATIONS—V.32s are available in the FasTalk™ configuration, designed especially for PC use.

INTERNATIONAL ACCEPTABILITY—Several versions of the UDS V.32 have already been qualified to non-U.S. operating standards, assuring their acceptability in multi-national networks.

For a look at the whole menu, contact UDS:

800/451-2369

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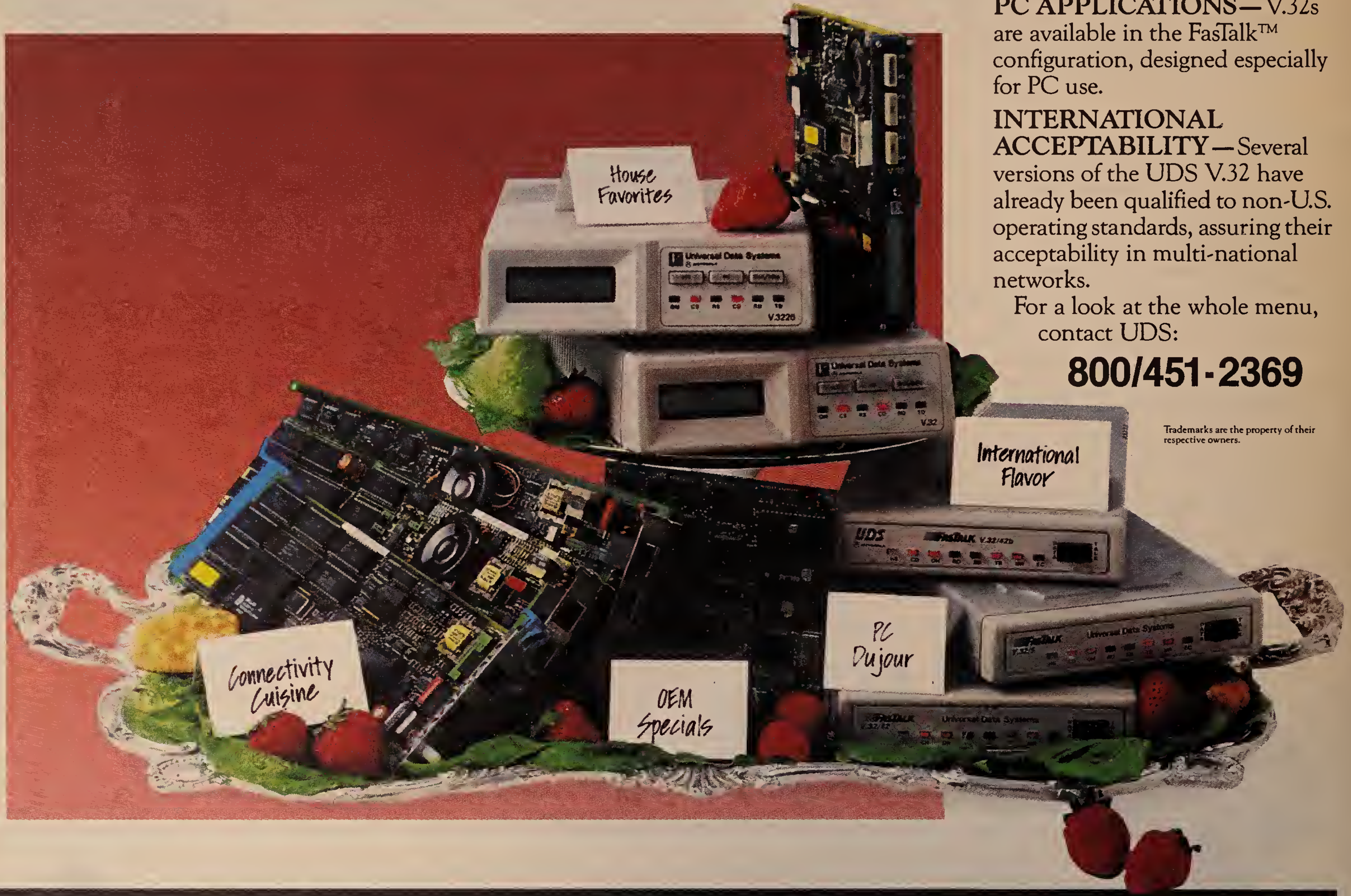


UDS

MOTOROLA

DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

Customers "know that what we're offering is real and applicable to the future."

Dave Korf
Director of Polycenter marketing
Digital Equipment Corp.
Maynard, Mass.
Referring to the company's management product conforming to the spirit of the OSF DME

Data Packets

Cascade Communications Corp. of Westford, Mass., last week announced an OEM agreement with **Advanced Compression Technology, Inc. (ACT)** under which ACT will purchase and remarket $8 million worth of Cascade's STDX frame relay switches over the next five years.

Cascade's STDX 3000 and STDX 6000 will be resold as the ACT MS-1000 and MS-2000 frame relay switches, respectively.

ACT will combine the STDX switches with its SDM-FP network access multiplexers to build frame relay networks. Pricing has not been set.

Netlink, Inc. of Raleigh, N.C., last week announced a new high-end model of its Digital Equipment Corp.-to-IBM SNA Gateway family.

The Internetwork SNA Gateway Model 4 supports up to 128 concurrent Local Area Transport (LAT) and Systems Network Architecture sessions — twice the number of LAT sessions available earlier. It adds a variety of new, user-definable utility functions that, for example, let users create custom terminal profiles and translation tables.

All Release 1.0 customers will receive free upgrades to Release 1.1. The software and Model 4 are available for a base price of $17,995. ◪

IBM pumps up mainframe connectivity capabilities

Unveils ESCON extender, TCP/IP wares for VSE.

By Michael Cooney
Senior Editor

NEW YORK — In an effort to bolster its sagging mainframe business, IBM has introduced 18 new System/390s along with a handful of new network capabilities for the mainframe.

The company unveiled improved remote Enterprise System Connection (ESCON) fiber data connections, Transmission Control Protocol/Internet Protocol support for the VSE platform and a new data compression feature.

The communications enhancements and the new mainframes, which are said to be 60% to 70% faster than any model shipping today, are designed to help integrate the "big iron" into growing client/server environments.

"As we continue to integrate the mainframe into the client/server architecture and [reduce the costs of mainframe computing via microprocessor technology], we think that eventually the mainframe will be cost-competitive with high-end workstation-based LANs," said David Steinhoff, manager of software marketing in IBM's Enterprise Systems business. "If users consider the total costs of computing, we think we'll be competitive."

In an effort to give users greater flexibility in net design, IBM announced the 9036 Remote Channel Extender, which lets customers use carrier-provided fiber-optic links to extend mainframe ESCON channels to data centers as far as 36 miles away. ESCON is IBM's 10M to 17M byte/sec fiber-optic channel technology.

The 9036 provides the conversion between multimode ESCON fibers and the single-mode fibers typically used by the telephone companies.

The 9036 will come in two models. Model 1, which will feature one multimode and one single-mode fiber port, will be priced at $17,000. Model 2, which will feature two multimode and single-mode fiber ports, will sell for $19,000. Both models will be available in October.

IBM also announced it will resell a TCP/IP gateway from

(continued on page 17)

NSA adds new Windows pack to its AS/400 suite

By Michael Cooney
Senior Editor

LAGUNA HILLS, Calif. — Network Software Associates, Inc. last week continued expanding its suite of IBM Application System/400 communications products with new Windows client software that offers users a less expensive, more powerful alternative to IBM's PC Support program.

The NSA Router for Windows is integrated with the company's Elite/400 5250-emulation software and runs on Windows-based personal computers. The software lets Windows users keep multiple PC applications active, such as spreadsheets and electronic mail, while simultaneously communicating with the AS/400.

Previously, Windows users with IBM's PC Support program had to log off open Windows applications, log on to the AS/400 and restart their Windows applications. Now users can easily pull information on the AS/400 and bring it into their PC application.

PC Support is IBM software that lets PCs communicate with the AS/400 processor.

NSA Router for Windows also lets users restart lost sessions with the AS/400 simply by clicking on an AS/400 icon. With PC Support, users must repeat the entire logon procedure.

The new software runs as a Windows application under NSA's Elite/400 and Elite/400 DSP 5250-emulation software. The emulators encapsulate 5250 protocols in LU 6.2 data streams in order to communicate with the AS/400. The Elite/400 emulators support a maximum of 32 sessions with multiple AS/400s.

(continued on page 17)

DEC minds others' business

Product name	Price	Availability
Polycenter Console Manager 1.0 Provides centralized management of up to 200 devices via ASCII text	$750 per device or $80,000 per 200 devices	April
Polycenter Framework 1.3 Launches any management application from GUI; can convert command-line interfaces to GUI; calculates statistics from RMON devices	$1,000	March
Polycenter Network Manager 200 and 400 1.3 Supports vendor-specific SNMP traps, PING protocol and vital statistics from RMON devices	$14,700 (200) $38,300 (400)	March
Storage Library System for OpenVMS 2.3	$350-$22,000	March
Polycenter Security Intrusion Detector 1.0	$400	May
Polycenter Security Compliance Manager 2.3	$400	June
Polycenter Software Distribution 2.4	$500-$8,000	March
Polycenter Performance Solution for Unix 1.0	$500-$2,400	March
DECtrace for OpenVMS 2.0	$8,430-$37,500	March

DEC's new Polycenter products are targeted at management of non-DEC systems, including Unix workstations.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

Polycenter moves to multivendor realm

DEC intros slew of product enhancements that will let Polycenter work with non-DEC equipment.

By Jim Duffy
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week filled out its multivendor network and systems management portfolio with a new Unix-based management console and enhancements to nine existing products.

The offerings are intended to shift DEC's Polycenter network and systems management strategy beyond its traditional VMS roots to address environments that include non-DEC equipment.

"We're integrating network and systems management across DEC and non-DEC environments," said Dave Korf, DEC director of Polycenter marketing. "The majority [of products] are not VMS-centric at this announcement."

Chief among DEC's expanded Polycenter product set is the new Polycenter Console Manager Version 1.0 software. The product runs on DEC Reduced Instruction Set Computing (RISC) Ultrix systems and serves as a central management station for as many as 200 devices. It can manage any device that produces ASCII text out of an RS-232 port, such as workstations, minicomputers, print servers and bridges.

With the Polycenter Console Manager, a systems administrator can view network events as they occur, receive notification of critical events that approach a defined threshold and boot directly connected or remote systems. Events are displayed on an Open Software Foundation, Inc. Motif graphical user interface using color-coded icons.

Enhancements to existing Polycenter products include new versions of the Polycenter Framework — previously called DEC Management Control Center (DECmcc) Director — and Polycenter Network Manager 200 and 400, which were known as the DECmcc Basic Management System and Enterprise Management System, respectively.

Version 1.3 of the Polycenter Framework — which runs on OpenVMS, Ultrix and Unix System V.4 machines — allows users to launch any management application from a menu-driven interface. Previously, users had to write a script for each third-party application they needed to run.

Another new capability of Version 1.3 is a script that helps users convert command line interfaces for existing management applications into the Polycenter Framework's graphical environment. This should enable users to retain their investment in existing management capabilities and information.

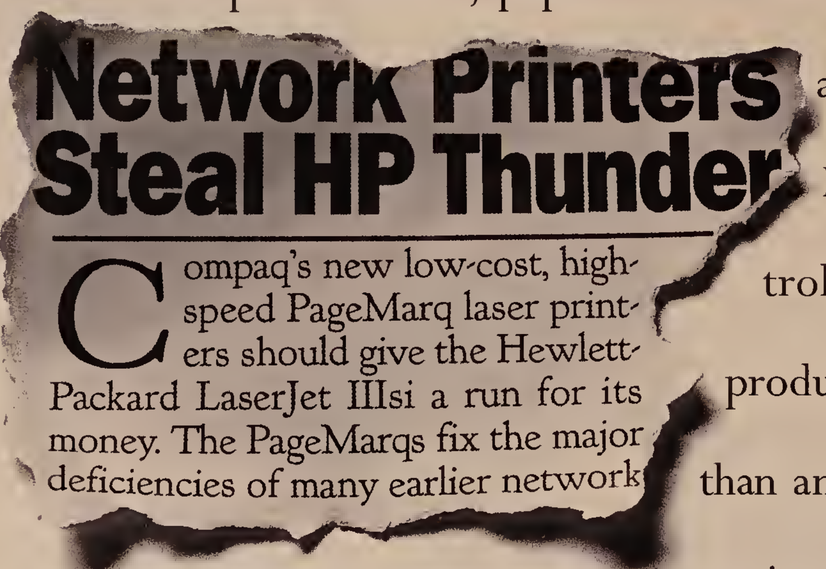
Version 1.3 also has enhanced Simple Network Management Protocol functions, such as the ability to collect meaningful statistics from devices supporting SNMP's Remote Monitoring

(continued on page 17)

COMPAQ PRINTERS NOT
PEOPLE PRINT, THEY CHAN

When we first introduced our network printers, the experts were at a loss for words. Not because they had little to say. The problem was finding words for printers that thoroughly outperformed all others.

When you add together the performance, paper-handling and unique network capabilities of the COMPAQ PAGEMARQ Network Laser Printers, it's no wonder they have received such overwhelmingly favorable praise from the industry's leading analysts and experts.



Network Printers Steal HP Thunder

Compaq's new low-cost, high-speed PageMarq laser printers should give the Hewlett-Packard LaserJet IIIsi a run for its money. The PageMarqs fix the major deficiencies of many earlier network

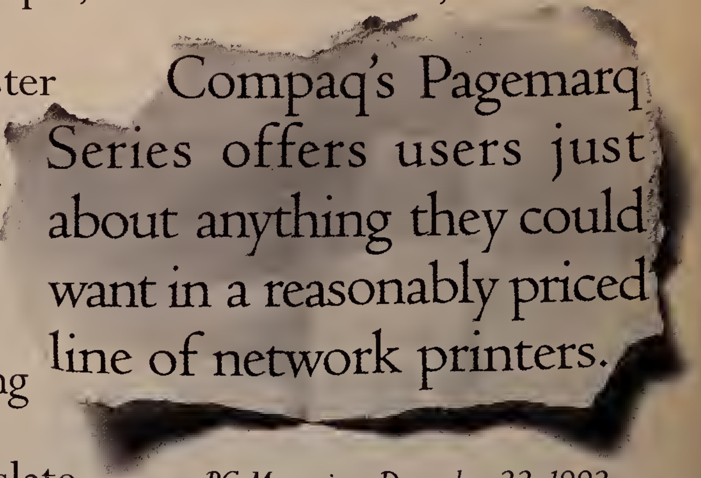
–*PC Week, September 7, 1992*

Powerful print engines along with our own RISC-based controllers, for example, produce output faster than any other printers in their class.

And so that printing quickly doesn't translate into quickly running out of paper, the COMPAQ PAGEMARQ 20 holds up to 1500 sheets of paper—more than any other desktop printer.

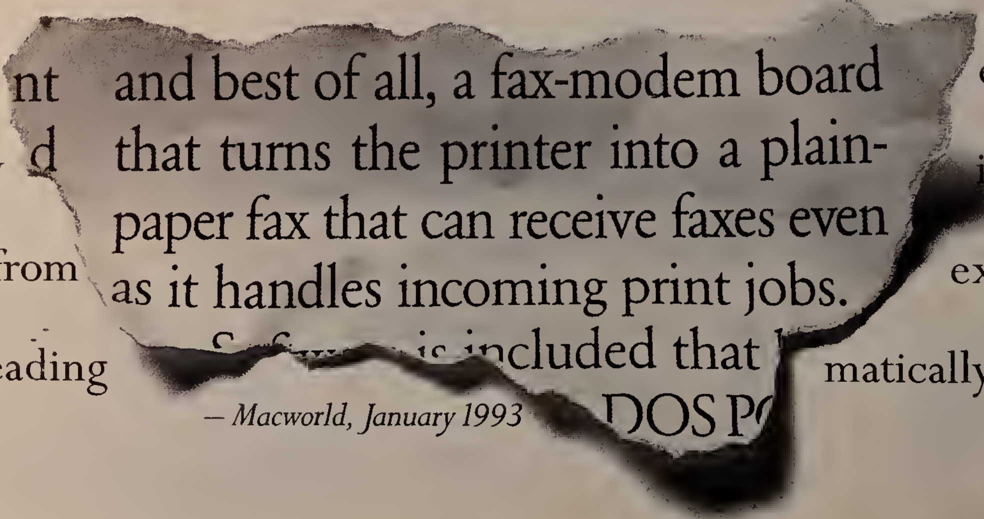
What's more, both the COMPAQ PAGEMARQ 15 and 20 can accommodate practically every size of paper, up to 11" x 17".

In complex network environments, even the biggest problems are no problem for COMPAQ Printers. Our intelligent emulation sensing feature, for example, automatically adjusts from



Compaq's Pagemarq Series offers users just about anything they could want in a reasonably priced line of network printers.

–*PC Magazine, December 22, 1992*



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and best of all, a fax-modem board that turns the printer into a plain-paper fax that can receive faxes even as it handles incoming print jobs. Software is included that

DOS P

– *Macworld, January 1993*

ONLY CHANGE THE WAY
GE THE WAY PEOPLE WRITE.

PCL* to PostScript and back again without your having to do a thing. So whether people on your network are using PCs, Macs, or both, COMPAQ Printers can easily and effortlessly take care of what everybody needs.

> On a desktop-publishing document that contained mixed text and graphics, the PageMarq 20 was almost 100 percent faster than the LaserJet IIIsi, while the PageMarq 15 ran about 50 percent faster than the HP printer.

—PC Week, September 7, 1992

We've also included five separate interfaces to allow for a variety of network connections. You can simultaneously run Token Ring or Ethernet, AppleTalk on LocalTalk, a serial and parallel port, and even an optional Internal FAX Modem that allows you to send and receive presentation-quality faxes directly from the printer.

> ’ printer sho
>
> nd According to analysts at BIS Strategic Decisions in Norwell, Mass., the Compaq printer has scored a bull's-eye. "Its kind of features are state-of-the-art. They've

—Computerworld, September 21, 1992

In addition to all that, our printers are covered by CompaqCare, the most extensive service and support program in the industry.

> Compaq is bringing a printer to the network printer market after listening to its most important resource: its customers. The PAGEMARQ series is a direct result of users' wants and needs.

—BIS Special Report, August 1992

You get a free one-year warranty with on-site service, as well as unlimited technical support via our hotline for as long as you own the printer.

For more details on the COMPAQ PAGEMARQ Printers, call. In the U.S., we're at 1-800-345-1518. Or in Canada, you can call us at 1-800-263-5868.

And find out more about the network laser printers that everybody's talking about.

And writing about.

According to PC Week, the COMPAQ PAGEMARQ Printers "speedily handle even complex documents."

The envelope please . . . In the few months since their introduction, our printers have already won eight prestigious industry awards.

COMPAQ

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SONY ENHANCED DATA GRADE D8. DESIGNED TO SAVE YOUR BUSINESS. NOT YOUR BIRTHDAYS.

D8 D-Eight

The more information your business generates, the more you stand to lose. Because not all the 8mm tapes used by business are designed for business.

So before risking valuable data to a tape made for saving video memories, rely on new Sony Enhanced Data Grade D8.

This compact D8 cartridge starts out where our video grade leaves off, holding up to 5 gigabytes, for today's high-capacity storage and archiving. With data security features you'd only expect from the inventor of the 8mm video format.

For instance, new D8 has a more durable media for greater data integrity, taking over 1,500 full back-ups, to keep your business moving forward.

The shell is made to resist warping, while an improved lid reduces friction through over 10,000 openings and closings. The result is a shelf life that will exceed 30 years under recommended conditions. So your data will be around when you need it.

Since lost data can cost your business its lifeblood, trust yours to the safest place of all.

Sony Enhanced Data Grade D8. A memory worth celebrating.

SONY

SONY RECORDING MEDIA

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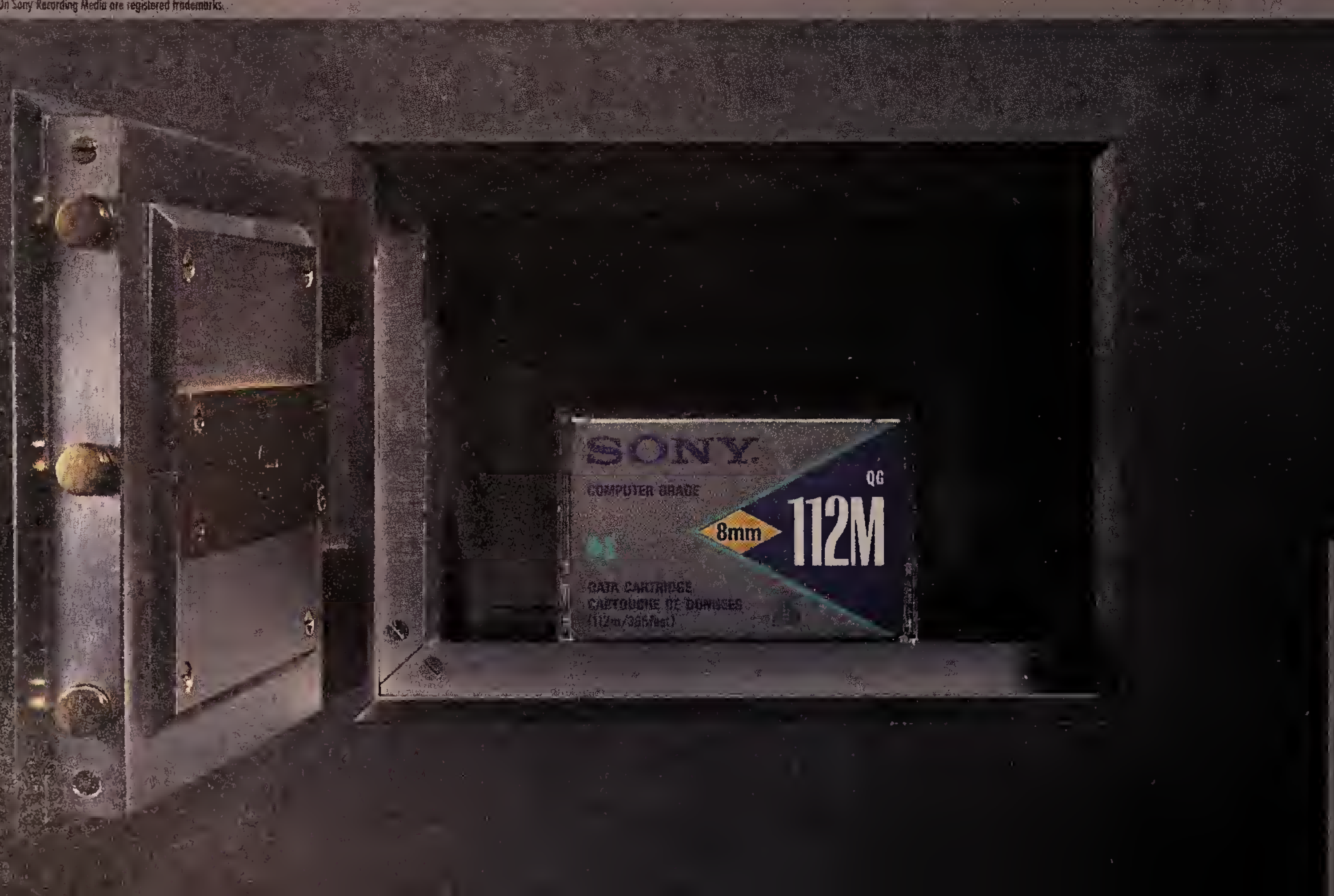


ONLY ON SONY
RECORDING MEDIA

LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

> "Network operating systems are becoming a commodity, bundled into the [main] operating system."
>
> **David Power**
> Marketing director
> SunSelect
> Chelmsford, Mass.

Netnotes

IBM and **Raylan Corp.** last week teamed up to announce the Raylan/IBM 8230 FiberLAM, a fiber-optic Lobe Access Module (LAM) for the IBM 8230 Controlled Access Unit.

With the 8230 FiberLAM, 4M or 16M bit/sec IBM Token-Ring users can connect as many as 18 devices over fiber cable at distances up to 3,300 ft, up from the 1,155-ft limitation with copper cable. Up to four FiberLAMs can be contained in a single 8230.

The Raylan/IBM 8230 FiberLAM Model I, with its own power supply, is available for $1,350, and the Model II, without a power supply, costs $1,150. Each device linked to the FiberLAM requires an 8230 fiber card, each of which costs $165.

Brightwork Development, Inc. last week announced a suite of Windows-based utilities to help remote LAN administrators manage Novell, Inc. NetWare local-area networks.

Targeted at managers of 20- to 50-user NetWare LANs, the software runs on a Windows-based LAN-attached console. Its six modules include LAN Automatic Inventory, SiteLock, NETremote, LAN Server Watch, PS-Print and LAN Tachometer.

The suite ranges in price from $495 for a 20-user version to $995 for a 50-user version. ◻

Vendor readies chipset to aid design of E-net hubs

Streamlines building of low-end hubs, cuts cost.

By Fredric Paul
Senior Editor

SANTA CLARA, Calif. — Advanced Micro Devices, Inc. (AMD) this week is expected to announce a new chipset that will simplify the design and lower the cost of building low-end managed Ethernet hubs.

AMD will introduce the Hardware Implemented Management Information Base (HIMIB), the first chip-level implementation of the IEEE 802.3 repeater management standard adopted last fall for 10Base-T Ethernet over unshielded twisted-pair wire.

The HIMIB will be combined with an enhanced version of AMD's widely used Integrated Multiport Repeater (IMR) hub chip, dubbed IMR+, according to Andy Robin, director of operations at AMD's Network Products Division.

AMD introduced the 84-pin IMR in 1990, and the company says it shipped four million IMR ports last year.

Garnering support

Both Hewlett-Packard Co. of Palo Alto, Calif., and NetWorth, Inc. of Irving, Texas, expressed support for the new HIMIB/IMR+ chipset, which is fully compatible with Novell, Inc.'s Hub Management Interface specification.

AMD expects that the chipset will be widely used in work group hubs, but it can also be used for low-end nonmanaged repeaters and managed server hubs.

Preproduction versions of the chipset are already shipping to at least one customer, Robin said, but he declined to name the company. Sample quantities will be available this week, with high-volume production expected in three weeks.

The first announcements of new repeater cards based on the AMD chipset should come within a month, and Robin predicted that within three to four months, six or seven of the top 10 hub manufacturers will announce new products based on the AMD chipset, although he would not name the companies.

Robin said AMD is producing an $845 Industry Standard Architecture hub kit based on the new chipset. This inexpensive and easy solution, he predicted, will allow new players to enter the hub market, quickly creating standard software-based hubs.

The new 28-pin HIMIB chip is essentially a management coprocessor that consists of 130

(continued on page 14)

Triton offers new version of modem-sharing pack

By Fredric Paul
Senior Editor

ISELIN, N.J. — Triton Technologies, Inc., last week released a new version of its CO/Session ACS modem-sharing software that lets users dial into and out of a LAN using a single set of PCs, modems and telephone lines.

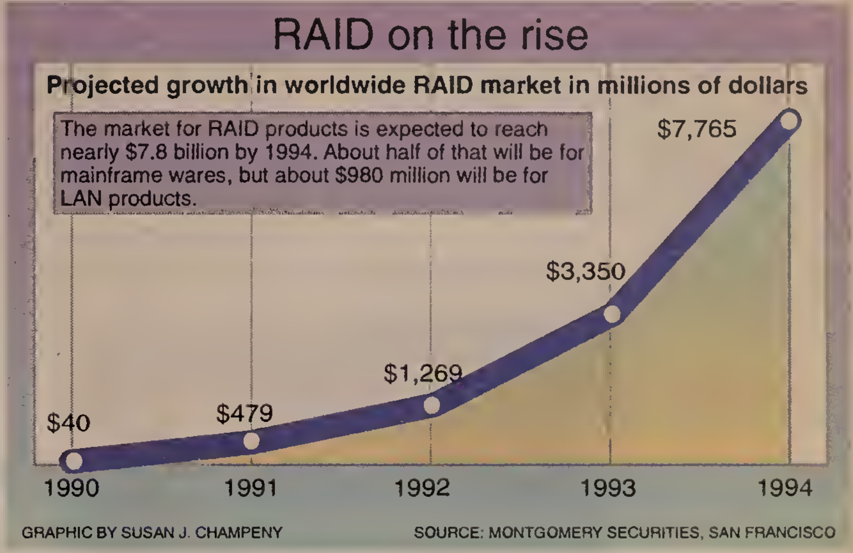
Previously, in order to share modems when dialing out of a Novell, Inc. NetWare or Network Basic I/O System network, users had to rely on asynchronous communications servers, such as Novell Asynchronous Communications Server (NACS). Dialing in required stacks of dedicated modems and personal computers connected to the local-area network, in addition to remote control software, such as CO/Session or Microcom, Inc.'s Carbon Copy, running on the remote client.

CO/Session ACS Version 6.1, which runs on each client machine, lets users share the same group of modems for dial in and dial out. Both functions combined use less than 9K bytes of random-access memory per workstation.

The system works by letting network administrators configure modems to dynamically default to autoanswer mode after completing an outbound call. That way, they no longer have to manually reset the modem state after each session.

The latest version of CO/Ses-

(continued on page 14)



RAID on the rise

Projected growth in worldwide RAID market in millions of dollars

The market for RAID products is expected to reach nearly $7.8 billion by 1994. About half of that will be for mainframe wares, but about $980 million will be for LAN products.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: MONTGOMERY SECURITIES, SAN FRANCISCO

RAID 5 system gets a shot in the arm

Chantal pack boasts 300% increase in speed, as well as hot-spare disks, broadcast messaging.

By Caryn Gillooly
Senior Editor

SAN DIEGO — Chantal Systems, Inc. this week is expected to bring out a new version of its Redundant Array of Inexpensive Disks (RAID) software for Novell, Inc. NetWare environments that gives users up to 300% performance improvement at a lower cost.

Paragon Disk Array Software 3.0 has a new write-optimization technology that supports parallel writes to the disk array. Other new features include a message broadcast capability that alerts users if a disk fails and hot-swap capabilities that enable the system to automatically switch from a failed drive to a previously installed spare drive.

Paragon 3.0 is software that resides on the NetWare server, providing RAID 0 (disk striping), RAID 1 (disk mirroring), RAID 5 (disk striping with parity) or any combination of the three storage capabilities. Because the Paragon product only consists of software, it can be used with any vendor's disk technology, unlike some proprietary hardware/software systems that require the user to buy a particular vendor's hardware.

Despite that flexibility, users of the previous version had complained about dramatic performance dips when many users tried to write to disk.

"We had [Paragon] Version 2.2 installed, and it wasn't as fast as some of the hardware-based [systems] we had seen," said Will Swearingen, engineering manager at CompuAdd Corp., based in Austin, Texas.

Frank Belucci, engineering manager at Chantal, based here, said this is a common problem with RAID 5 systems. He explained that, typically, there are three operations that take place for every write command issued: read, modify and write.

To improve performance, Chantal has implemented what it calls Intelligent Stripe Job Combination (ISJC). With ISJC, separate write commands written to the same stripe on a drive are combined before being written to the subsystem — a single read, modify, write action can be executed for multiple write commands.

> Since the product only consists of software, it can be used with any disk technology.
>
> ▲▲▲

If, for example, three write commands are sent, the system only performs one read, modify, write operation as opposed to the nine separate operations — three reads, modifies and writes — required with the previous version of the product.

Users seemed pleased with the improvement. "In our environ-

(continued on page 14)

Vendor readies E-net hub chipset

continued from page 13

registers, including 14 registers for each port and four global registers.

The HIMIB listens to traffic going through the repeater, automatically monitoring events. HIMIB keeps statistics on such data as how many readable frames went through the repeater, how many collisions were noted and how often a node had to be partitioned off for threatening to hog the network.

Currently, managed hubs use one of a variety of proprietary management capabilities. Adherence to the IEEE 802.3 standard will help administrators in large networks deal with a hierarchy of hubs, Robin said.

The new standard is likely to become a minimum requirement for repeater management, with vendors adding their own proprietary capabilities.

Putting support for the new standard on a single chip, meanwhile, cuts in half the amount of silicon needed in comparison to a standard managed Ethernet hub at the center of a star-wired network, according to Robin.

Because the HIMIB handles the management functions, it eliminates the need for a relatively expensive 16-bit processor, letting repeater cards make do with a cheapo 8-bit processor without hurting performance.

Putting the management on a chip also reduces the card's memory requirements and the need for custom development and debugging of hardware and software, lowering prices and speeding time to market. ◻

RAID 5 system gets shot in the arm

continued from page 13

ments, with heavy writing, the system worked about four times as fast," Swearingen said.

Others agreed. "We found the new system to be about 300% faster than the old version," said John Probst, programmer at Lowery, Inc., a Paragon 3.0 beta site based in Park City, Utah. "In fact, with the old system we didn't use RAID 5 because it was too slow. But we use RAID 5 now, and the new speed is just phenomenal."

Paragon 3.0 also includes a new hot-swap capability that is used with the new messaging capabilities. According to Chantal, if a drive in the array fails, data is reconstructed on the fly and automatically written to a previously installed hot spare.

If the hot-spare is used, a systemwide message will be broadcast to all workstations on the local-area network saying a drive has failed. With the previous version, the message was only sent to the network administrator, and if the administrator was not present, the drive failure could go unnoticed.

Another benefit of the new software is the price. Paragon 3.0 is available now for $995. The previous version cost $1,495. ◻

Triton offers new modem-sharing pack

continued from page 13

sion ACS also adds new dial-in capabilities. Workstations on the network can be set to a special listen mode. When remote users dial in, they receive a menu of available workstations in this mode and can select the workstation to which they want to connect.

This capability also makes CO/Session ACS useful for remote product support because users can dial into the LAN and select the appropriate workstation from a menu.

CO/Session ACS 6.1 now supports line speeds up to 57.6K bit/sec, up from 19.2K bit/sec, and as many as 20 modems on a single network, up from the previous 10. Other new features include modem and user password protection and control of file transfers from the command line or via the menu.

Triton bundles CO/Session ACS with an Interrupt 14 version of its CO/Session Host and Remote packages, providing remote control, VT-100/102 terminal emulation, file transfer and modem sharing in a single package. The software is compatible with leading communications packages that support Interrupt 14 — an interface specification between desktop software and a shared modem — such as Datastorm Technologies, Inc.'s ProComm Plus for Windows, Digital Communications Associates' CrossTalk, Walker Richer & Quinn, Inc.'s Reflections, Hayes Micromputer Products, Inc.'s SmartCom, and Microcom's Relay Gold.

Available now, a two-modem package of CO/Session ACS 6.1 sells for $345, a package supporting five modems is priced at $595, and a version to support a maximum of 20 modems costs $1,295. Users of older CO/Session ACS versions can upgrade for $95. ◻

"Uh-Oh . . ." *Donna, Accounting*

"What The . . ." *Dan, Drafting*

"Hey!" *Todd, Shipping*

"Whoa!" *Jan, Production*

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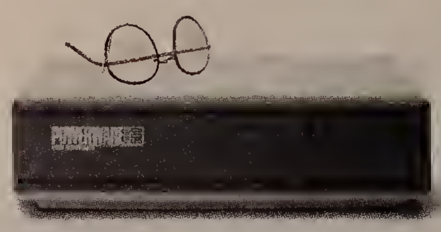

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"Smart switching hubs will be the product of the '90s because they are the most strategically placed."

Tom Nolle
President
CIMI Corp.
Voorhees, N.J.

Link Notes

Clearpoint Research Corp. last week said it has reduced the prices on several interfaces for its Constellation Series of bridge/routers.

Prices on dual-port local-area network cards have been reduced to $1,495 each, while single-port cards have been reduced to $970. The six-port 10Base-T card has been reduced to $1,100. The new prices are effective immediately.

For more information, contact Clearpoint at (508) 435-7525.

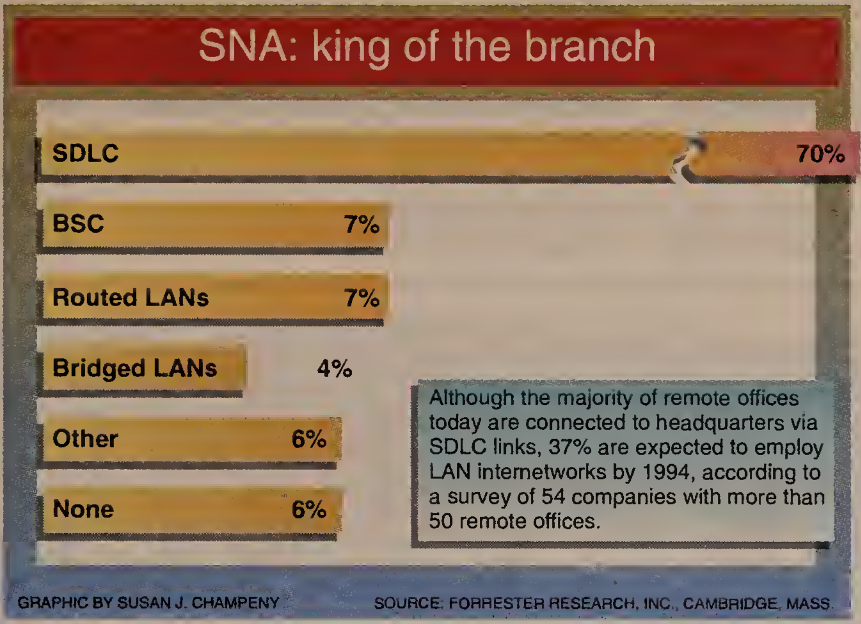
Cayman Systems, Inc. last week upgraded the software for its GatorBox CS LocalTalk-to-Ethernet router and GatorStar GX LocalTalk-to-Ethernet router/repeater with new Simple Network Management Protocol Management Information Base (MIB) support, mapping and automatic problem isolation.

Release 2.2 of the software now supports the AppleTalk and 802.3 SNMP MIBs as well as MIB II.

It also lets net managers use SunConnect's SunNet Manager and Cabletron Systems, Inc. Spectrum consoles to collect data on GatorBoxes and GatorStars on the net.

The new release allows managers to gather port- and node-specific statistics, including net traffic level, number and type of errors, port

(continued on page 16)


SNA: king of the branch

Although the majority of remote offices today are connected to headquarters via SDLC links, 37% are expected to employ LAN internetworks by 1994, according to a survey of 54 companies with more than 50 remote offices.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

HP eases net management with proactive applications

Apps help control traffic, plan for future needs.

By Skip MacAskill
Staff Writer

PALO ALTO, Calif. — Hewlett-Packard Co. this week will roll out a suite of network management applications that will recommend actions net administrators can take to control traffic, regulate capacity and plan for future network growth.

The company is adding three knowledge-based tools to its Embedded Advanced Sampling Environment (EASE) management software package found in its EtherTwist family of hubs and bridges. The tools will proactively analyze network information and determine appropriate solutions to a wide range of problems.

> The tools will proactively analyze net information and determine solutions.
>
> ▲▲▲

EASE compiles statistics on network traffic, analyzes that information and presents it in a graphical format to the net administrator via HP's OpenView net management system running on a management console.

The new applications include HP OpenView Traffic Expert, which establishes a baseline of current network performance and traffic conditions.

After analyzing that information, Traffic Expert generates a report that prescribes a course of action, such as moving end nodes or adding filtering devices, allowing net administrators to maximize net performance and avoid traffic congestion.

Another new tool, HP OpenView History Analyzer, compiles historical data that assists administrators in assessing usage and future capacity planning.

By comparing network statistics to the baseline established by History Analyzer, net managers can anticipate trends and plan for net additions, changes and redistribution of network resources.

The third application, HP OpenView Resource Manager, provides a real-time, simultaneous view of all net segments.

By continuously tracking network activity, Resource Manager can graphically show when network performance is about to exceed preset parameters.

The three applications, which support the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX), DECnet Phase IV and AppleTalk, operate with Unix operating systems, such as Sun Microsystems, Inc.'s SunOS. Resource Manager is also available for DOS systems.

Resource Manager will be available in the second quarter and cost $4,000; History Analyzer will cost $6,000 and be available in the third quarter; and Traffic Expert will be available in the fourth quarter and cost $8,000.

UB Ethernet module heats up ATM race

New RISC-based switching modules for intelligent hub series deliver ATM-like benefits to users.

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — Hoping it will breath fire into its internetworking strategy, Ungermann-Bass, Inc. last week announced the DragonSwitch, a new Ethernet switching module for its intelligent hub line.

The company also introduced a net management application for its NetDirector net management system that will let net administrators manage the new Ethernet switching module.

When combined with UB's Virtual Network Architecture (VNA) software — which allows users to create virtual work groups — the DragonSwitch can provide workstation users with dedicated 10Base-T Ethernet links, support multimedia applications and nearly unlimited logical segmentation of existing Ethernet networks ("SynOptics, UB plot new net strategies," *NW*, Feb. 15).

"We're trying to build a network infrastructure that's not burnt toast tomorrow," said Ralph Ungermann, president and chief executive officer of UB. "Because [Asynchronous Transfer Mode] is still many years away, we need a solution today that can deliver the benefits of ATM in existing nets to increase performance, create work groups and support multimedia. DragonSwitch and VNA allows the user to do that."

Residing in UB's Access/One intelligent hub, each of DragonSwitch's 16 ports can support a dedicated 10M bit/sec link. Each module supports two Intel Corp. i960 Reduced Instruction Set Computing chips that act as switching engines.

Traffic can be switched between ports on the same module and, via Access/One's 400M bit/sec PlusBus backplane, among ports on other modules in the hub. As many as five DragonSwitches, for a total of 80 ports, can be used in an Access/One hub, with support for as many as 40 simultaneous Ethernet con-

(continued on page 16)

Bytex adds OpenView to Series 7700

By Maureen Molloy
Senior Writer

WESTBOROUGH, Mass. — Bytex Corp. last week announced plans to port the management system for its Series 7700 line of switching hubs to Hewlett-Packard Co.'s OpenView.

The firm will also unveil a smaller version of its 7760 hub for remote sites, as well as a fiber extender that will enable users to integrate third-party multistation access units (MAU) in collapsed backbones based on a Series 7700 hub.

Plans to port the capabilities of Bytex's existing Series 7000 Network Management System (NMS) to OpenView will enable users to integrate hub management with multivendor devices and more than 100 applications available on OpenView. Series 7700 NMS currently runs under SunConnect's SunNet Manager or a personal computer-based Windows 3.1 platform.

The Series 7700 NMS for OpenView software application will be available this quarter for $5,995.

Bytex will also announce its 7720 Branch Office Switching Hub, which links token-ring local-area networks at remote sites to corporate LANs. The six-slot hub supports both 4M and 16M bit/sec token ring and enables users to connect up to 24 shielded or unshielded twisted-pair ports. The hub has the same matrix switching backplane as the vendor's high-end 7760 hub.

The hub will be available this quarter for $4,995.

The vendor also unveiled its 7703 Fiber Ring-In/Ring-Out Extender that will let users link MAUs and hubs from other vendors to a 7700 hub via fiber I/O ports. The 7703 costs $2,395 and is available now.

UB Ethernet module heats up ATM race

continued from page 15

versations at 10M bit/sec each.

Similar switching modules for both Fiber Distributed Data Interface and token-ring environments will also be rolled out by UB, but the company declined to provide specific time frames.

Available in the second quarter, the DragonSwitch module is priced at $14,400, or $900 per port.

To manage these modules, UB unveiled NetDirector/VNA, an application for its NetDirector net management platform that provides users with point-and-click control over the creation and management of as many as 65,000 virtual work groups or network segments.

NetDirector/VNA features a domain management capability that allows multiple net administrators in different locations to simultaneously access portions of a central database containing management information specific to their region.

The application can logically map the physical address of stations on the network to any number of virtual work group segments. This allows a net manager to logically move any device to any segment or virtual work group in the network. The new configuration is then automatically updated by the mapping feature.

The NetDirector/VNA application enables the user to access NetDirector's SQL databases, which allows them to do configuration and performance monitoring for the virtual work groups.

NetDirector/VNA will be available in the second quarter and cost between $3,500 and $8,500, depending on configuration.

UB also announced last week that Advanced Computer Communications (ACC) and Wellfleet Communications, Inc. have pledged to make their respective internetworking product lines compatible with VNA, although the companies declined to provide further details. Starlight Networks, Inc. will provide the DragonSwitch as an option in its video application server.

In general, analysts were supportive of UB's Ethernet switching approach.

"Network infrastructures need to be reengineered without ripping up all existing cables and junking the installed base," said Todd Dagres, vice president of data communications at The Yankee Group, a Boston-based consultancy. "The type of switching that UB is proposing will become dominant as long as the switching can be done at the port level and offer some degree of manageability."

The rollout of DragonSwitch and NetDirector/VNA represents the first phase of UB's three-phase plan to migrate users to ATM.

In the second phase, UB will extend VNA's virtual work group support across the wide area through integration with bridges and routers. Those products are expected by the fourth quarter.

The third and final phase will involve the implementation of VNA in ATM switching products being jointly develop by UB and BBN Communications. According to UB, those products will be available in the first quarter of next year. ◘

Link Notes

continued from page 15

status and device name.

For the GatorStar, Release 2.2 automatically disables malfunctioning LocalTalk ports to prevent errors from propagating across the network and automatically restores the port when the problem is resolved.

The software upgrade, which is available now, is free of charge to all GatorStar users and GatorBox users signed up for GatorCare, the company's software maintenance plan. Other users will pay a $199 upgrade fee.

For more details, call Cayman at (617) 494-1999.

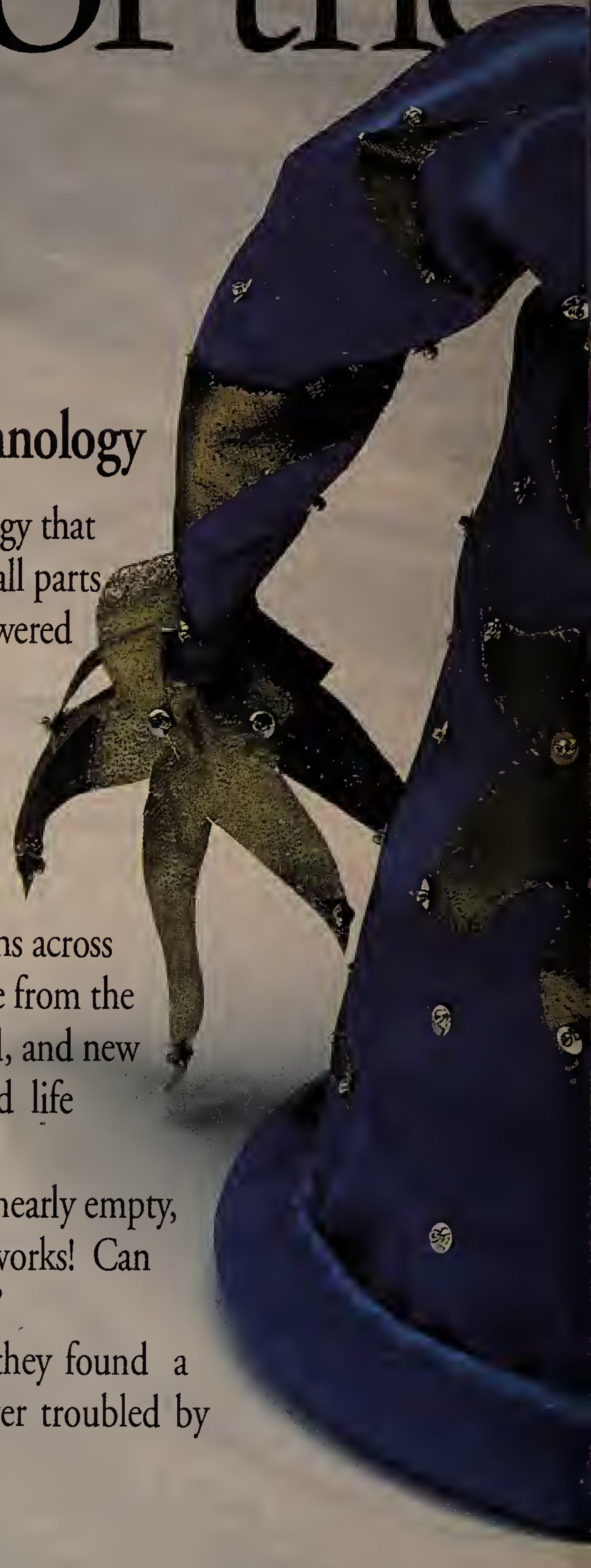
LANNET Data Communications, Inc. has released two new Ethernet interface modules for its MultiNet line of hubs that enable users to configure ports for participation in any of the four Ethernets the hubs support.

The LE-140XTQ is a $2,195 10-port 10Base-T module that supports both shielded and unshielded twisted-pair connections via RJ-45 jacks.

The LE-110BQ is a $2,195 six-port 10Base2 Ethernet repeater module. Both are available now.

LANNET also rolled out the LE-46T 10Base-T Ethernet transceiver, which has one attachment unit interface port and two shielded RJ-45 ports for connection to either shielded or unshielded twisted-pair wire. One link remains inactive and automatically kicks in if the main link fails. Available now, the transceiver costs $445.

For further information on all products, call LANNET at (714) 891-5580. ◘



Secrets of the

Secret #1:

Dispelling the Myth of the Golden Technology

Long ago, the King learned of a Golden Technology that could carry information, even the King's very likeness, to all parts of the realm. The King was greatly impressed, and showered gold upon those who could work this miracle.

And it was as they said: the devices were installed, and the Golden Technology brought to life. Information flew across the kingdom, and all was well.

In time other wonder-workers came, and told of another Golden Technology that would speed transactions across the land. But the King must add a new network separate from the old. Again the coffers were opened, new devices installed, and new incantations learned. More than once this happened, and life became increasingly complex.

"Enough!" cried the King at last. "The coffers are nearly empty, and my people boggle at the complexity of the royal networks! Can we not find the true Golden Technology for every need?"

Far and wide the King's people searched, until they found a Wizard of Information Technology in a kingdom never troubled by

Become a Wizard of I.T. and choose the best technology for each application.

NSA adds Windows to its AS/400 suite

continued from page 9

Elite/400 is a full-blown 5250-emulation package supporting remote file access, messaging and SQL database queries. Elite/400 DSP is a lower level 5250-emulation package for users needing only 5250-emulation and file-transfer abilities.

"The key benefit to the NSA Router is that it lets users replace the cumbersome IBM DOS-based PC Support router," said Martin Smith, product manager for NSA. "We built our software from the ground up as a Windows application."

The other major advantage the NSA product has over the PC Support program is it handles Network Basic I/O System and Novell, Inc. NetWare for SAA environments. PC Support does not natively support those services without many extra routines that the user would have to code.

The NSA Router for Windows is available for no extra charge in Version 2 of the Elite/400 emulators. Elite/400 DSP costs $295, and Elite/400 costs $395. Version 1 users can upgrade to Version 2 for free. ☐

Polycenter moves to multivendor realm

continued from page 9

(RMON) Management Information Base instead of raw data. It also allows users to collect vendor-specific SNMP traps.

Polycenter Framework 1.3 costs $1,000 and will be available in March.

The Polycenter Network Manager 200 and 400 — which run on RISC Ultrix and VAX VMS machines — also have improved SNMP support, including the ability to collect RMON statistics and display vendor-specific SNMP traps. Both systems also use the PING protocol to determine whether an Internet Protocol device is on-line.

DEC also upgraded several other Polycenter products. Version 2.3 of the Storage Library System for OpenVMS now supports DEC Rdb database backups using DEC's Rdb Management Utility/Backup Engine. And Polycenter Security Intrusion Detector, which detects system security breaches, now supports RISC Ultrix and SunOS operating systems.

The new 2.3 version of DEC's Polycenter Security Compliance Manager, which checks system compliance to predefined security parameters, now supports HP-UX and IBM AIX operating systems.

Polycenter Software Distribution Version 2.4 now supports DEC Alpha clients running OpenVMS, as well as VAX 4000 workstations. The product is used to install workstation software from a VAX server.

Polycenter Performance Solution, which collects performance data on OpenVMS systems, has been extended to Ultrix and SunOS operating systems. Also, DECtrace for OpenVMS Version 2.0, which tracks the performance of applications for network tuning, now employs a DECwindows Motif user interface that graphically displays event data in real time.

Analysts welcome DEC's Unix focus.

"One of the biggest problems my clients have with Unix is lack of security and lack of the ability to control the machines in a production environment," said Howard Niden, a senior manager at Price Waterhouse in Chicago.

Traditional VMS users agreed.

"Unix is certainly something that we're going to have to develop some sort of policy for," said Walt Wojciehowski, associate director of information systems management at Massachusetts Mutual Life Insurance Co. in Springfield, Mass. Eventually, the need to tie [Unix and VMS] together is going to be important, as is how you manage all of that." ☐

IBM pumps up mainframe connection

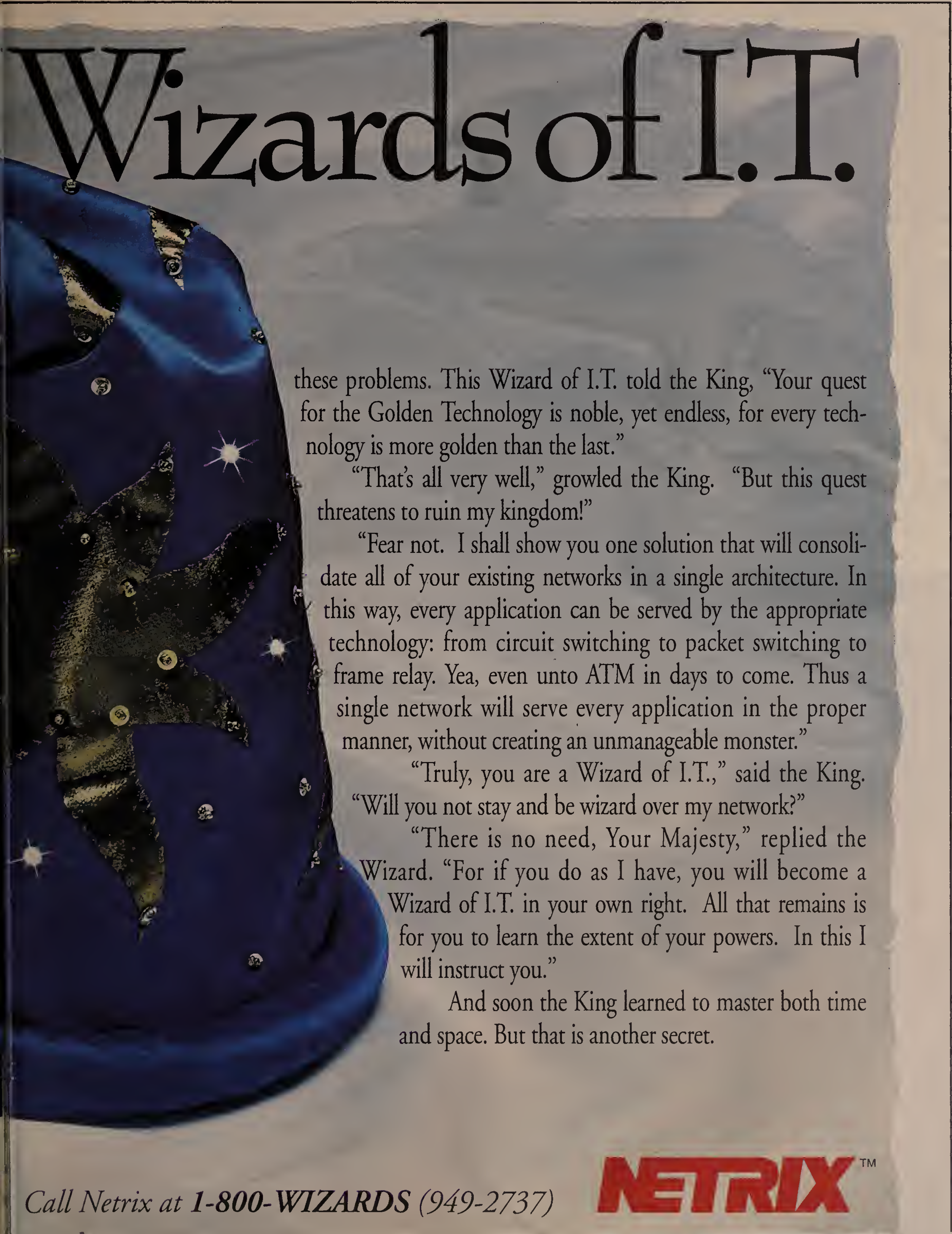
continued from page 9

OpenConnect Systems, Inc. (OCS) of Dallas to provide VSE mainframe users connectivity to TCP/IP nets.

Under the agreement, IBM will sell OCS TCP/IP gateway software and an accompanying mainframe-based OCS File Transfer Protocol (FTP) application to VSE users that want to combine their TCP/IP and Systems Network Architecture nets.

The OCS gateway software resides on a variety of industry-standard Unix platforms, including the IBM RISC System/6000, and translates TCP/IP into SNA so TCP/IP users can have access to 3270 applications on the mainframe. It can also translate SNA into TCP/IP to give 3270 users access to the OpenConnect FTP application residing on the VSE mainframe.

The OCS products are available now. Pricing for the gateway varies depending on the number of mainframe sessions it supports. For example, a 16-session version costs $5,000, and the 256-session version costs $19,000. FTP application pricing starts at $660 and increases to $6,645, depending on processor size. ☐



Wizards of I.T.

these problems. This Wizard of I.T. told the King, "Your quest for the Golden Technology is noble, yet endless, for every technology is more golden than the last."

"That's all very well," growled the King. "But this quest threatens to ruin my kingdom!"

"Fear not. I shall show you one solution that will consolidate all of your existing networks in a single architecture. In this way, every application can be served by the appropriate technology: from circuit switching to packet switching to frame relay. Yea, even unto ATM in days to come. Thus a single network will serve every application in the proper manner, without creating an unmanageable monster."

"Truly, you are a Wizard of I.T.," said the King. "Will you not stay and be wizard over my network?"

"There is no need, Your Majesty," replied the Wizard. "For if you do as I have, you will become a Wizard of I.T. in your own right. All that remains is for you to learn the extent of your powers. In this I will instruct you."

And soon the King learned to master both time and space. But that is another secret.

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GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

Revenues from sales of local exchange service will climb steadily from $51.8 billion this year to $74.0 billion in 1998, according to a recent study by The Insight Research Corp., a Livingston, N.J., consulting and research firm.

Regulatory Update

After more than five years of legal wrangling, **Nynex Corp.** last week was fined $1 million for violating the information services restriction of the Modified Final Judgment (MFJ). Nynex was charged with and indicted for criminal contempt for its April 1986 purchase of Telco Research Corp., a software and database firm in Nashville.

Nynex last week vowed to appeal the ruling. The carrier said that if it violated the MFJ, it was an honest mistake. "There is a serious ambiguity in the [MFJ] stemming from the fact that computers — which we unquestionably were permitted to provide — also possess processing capacity that we were restricted from providing in some ways under other provisions of the [judgment]," Nynex said in a prepared statement last week.

A focal point of the trial, which was presented to U.S. District Court Judge Harold Greene, was an on-line tariff library service offered to MCI Communications Corp., among others. Greene said it was clear that the MFJ prohibits such a service.

The fine amount was set to ensure Nynex understood the gravity of its violation. The $1 million is equal to one-tenth of 1% of Nynex's average annual net income, $1 billion.

France Telecom outlines plans for overlay ATM net

New network will handle high-speed data services.

By Bob Wallace
Senior Editor

PARIS — France Telecom, Inc. has detailed plans to build an overlay network of Asynchronous Transfer Mode (ATM) switches that will enable the carrier to roll out new high-speed data services.

The net will be based on Alcatel N.A., Inc. or Thomson-CSF ATM equipment and will enable the carrier to offer Switched Multimegabit Data Service and add to its local-area network interconnection offerings.

"Supporting new and current services on a single platform is easier and less expensive," said Yves Parfait, high-speed services marketing manager for France Telecom. "We'll begin offering new services from the overlay in early 1994."

France Telecom is the first European carrier to formally announce plans to build an ATM overlay net, but industry analysts expect others to follow suit.

Parfait said the overlay network will initially comprise about 20 to 30 ATM switches and companion concentrator devices that will aggregate traffic into the ATM systems. The switches will be interconnected using Synchronous Optical Network links.

One of the new services the carrier will offer is Connectionless Broadband Data Service (CBDS), the French equivalent to SMDS. France Telecom will initially offer CBDS at speeds of 2M and 34M bit/sec to users in the Paris metropolitan area, as well as Marseilles and Toulouse. The service will later be boosted to 100M bit/sec.

"Although more than half of our customers will be located in and around Paris, we hope to take the service [nationwide] soon after it's announced early next year," Parfait said.

France Telecom will also offer Virtual Path (VP), an ATM service akin to frame relay that will offer more flexible high-speed LAN-to-LAN links than are available today.

Igor Douplitzky, broadband services marketing manager for France Telecom, said VP will initially operate at 34M bit/sec and could be used by customers on a reservation basis. The carrier has not yet set pricing for VP.

The carrier is experimenting with a number of services as part of a technical field trial. They would eventually be offered over the ATM overlay net.

"You'll see a new breed of high-speed data services [offered] over this network in the future," Douplitzky said. "We realize that the future of high-speed data services lies with ATM."

FCC irons out lingering 800-portability questions

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — After months of pressure from users, the Federal Communications Commission last week resolved several lingering technical and administrative 800-portability issues.

The FCC ruled that as part of the basic 800-portability service, carriers must allow users to cut over to portable 800 numbers on an area-by-area rather than a nationwide basis. The agency also issued guidelines dealing with which entities users may designate to deal with local carriers in order to get 800 traffic routed to a new long-distance carrier.

In a second recent order, the FCC also laid out how carriers will be allowed to charge for portable 800 numbers. The agency said local carriers will be able to charge a fee for each database lookup to route an 800 call but stressed the fee should be based on the cost of providing the service.

All the decisions helped put to rest nagging concerns users had about how well the cutover to 800 portability will work in practice. With such a major network overhaul, involving both local and long-distance carriers, literally hundreds of technical and admin-

(continued on page 20)

Different flavors of international carrier partnering

Cooperative agreements:
2 or more carriers agree to work closely in designing, installing and operating customer networks.

Connection and joint marketing agreements:
2 or more carriers enter into an arrangement where they connect previously incompatible networks or services, or reciprocally market and support each other's services.

Operational mergers:
2 or more carriers merge their international groups or departments.

Integrated network management and services ventures:
2 or more carriers form a new company for installing and supporting services for end users. These ventures purport to provide total network implementation, operation and management for multinational user companies.

SOURCE: LYNX TECHNOLOGIES, INC., LITTLE FALLS, N.J.

Knowing the rules of PTT-carrier deals

Various partnering agreements aid in development of international nets but can have pitfalls, as well.

This second of a two-part series details existing types of PTT-carrier arrangements and examines the strengths and weaknesses of each. Last week's installment detailed the events that led to the creation of an array of PTT-carrier relationships.

Len Elfenbein
Special to Network World

Setting out to build a global network without a strong understanding of existing and emerging relationships between PTTs and carriers is like playing a game without knowing the rules — your chances of winning are slim.

Over the years, carriers and post, telegraph and telephone administrations have been working together to varying extents to help multinationals simplify the process of constructing international networks.

The oldest and most common form of partnering agreements between U.S. carriers and PTTs consists of two or more of such entities executing an agreement whereby each pledges to work closely with the other in designing, installing and operating customer networks.

This type of arrangement became popular in the mid-1980s and was referred to as one-stop shopping.

The weakness of these arrangements, however, is that there is no unified, separate or dedicated staff to focus on customer requirements or support customer networks. Each partner simply pledges to work efficiently with the other.

Another weakness is that customer network circuits or services are usually required in countries where the local PTTs are not members of the partnering agreement. These other administrations do not appreciate being screened from contact with the customer. They often insist on direct contact contrary to the customer's understanding that the one-stop shopping partner will handle all necessary details in all countries. In some cases, third-party PTTs have resented these arrangements enough to drag their feet in installing services or to provide limited cooperation and support.

The second form of PTT partnering is one in which two or more PTTs enter into an arrangement where they connect previously incompatible networks or services, or reciprocally market and support one another's services.

The PTTs involved install facilities to deal with problems such as network incompatibilities. This type of venture is, therefore, one of joint simplification and the marketing of improved or simplified services to end users.

The third form of PTT partnering involves two or more PTTs or

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Knowing the rules of deals

continued from page 19

carriers merging their overseas groups or departments. An example of this type of venture is Unisource, a new venture formed by the merger of the international operations of PTTs in The Netherlands and Sweden. This involves a more serious commitment as well as a profound change for the administrations involved.

BT, Germany's Deutsche Bundespost (DBP) Telekom and France Telecom are generally regarded as the dominant carriers in Europe. The PTTs in The Netherlands and Sweden can only compete effectively with these carriers through a pooling of interests and operations.

While such relationships may begin with two members, they can be expanded to accommodate additional venture partners on the same or other continents. These relationships will probably be limited to PTTs that are not dominant in their regions but may include new carriers in a country without a dominant carrier.

The primary disadvantage of these alliances is that they probably will not include members from countries of greatest importance to users.

An advantage is that carriers in countries such as the U.S., the U.K., France, Germany and Japan usually consume most of their energies in conflict with each other, but maintain fairly cordial and even friendly relations with these second-level PTTs.

The fourth form of partnering is where two or more PTTs form a new company for the purpose of installing and supporting services for end users. These ventures can be termed integrated network management and services ventures because they purport to provide multinational companies with total network implementation, management and operation — also known as outsourcing.

During the past two years, the larger PTTs have worked hard to negotiate these types of ventures. This type of partnering targets the one-stop shopping market. Where the first kind of partnering simply involves cooperative agreements between PTTs, this type of partnering involves dedicated facilities, personnel and substantial capital.

Syncordia

Of the four types of partnering arrangements outlined above, the first three address carrier problems, limitations or economies of scale. Only the last represents a sound long-term strategy for PTTs and carriers.

The first serious venture of this type is Syncordia Corp., which was formed by BT in 1991 following a somewhat extended gestation period.

The announcement of Syncordia's creation was supposed to include DBP Telekom and Japan's Nippon Telegraph and Telephone Corp. as founding partners. When both backed out, BT proceeded with the venture alone.

That means Syncordia today doesn't follow the definition of an integrated network management and services venture because it only includes BT, but Syncordia is actively recruiting other carriers for its outsourcing services.

Most telecommunications managers who have seen a Syncordia presentation on proposed global network management services have a good news/bad news reaction. The good news is that the services represent a telecommunications manager's wish list. The bad news is that most of the services currently exist only on Syncordia's overheads.

A realistic appraisal of Syncordia's prospects is that it will continue in the short term to be in a developmental stage and will not be ready for some time to deliver the full-service package it has promised. On a long-term basis, Syncordia promises to be both a credible and formidable factor in the global network management marketplace.

Competition ahead

It is also likely that Syncordia will have a head start against the substantial competition that is sure to develop. AT&T continues to roll out new services in bits and pieces, including those under AT&T Istel in Europe and its own name domestically. It has yet to announce a well-planned, integrated approach to installing and operating global networks for users.

For their part, MCI Communications Corp. and Sprint Corp. have also been working on strategies of their own. The trade press has reported efforts by Sprint to enter the U.K. marketplace as the BT-Cable & Wireless PLC duopoly begins to fade. MCI can enter foreign countries through its minority stake in Infonet Services Corp., an international value-added network operator.

All of the major carriers continue with efforts to roll out state-of-the-art services ranging from virtual networking to Integrated Services Digital Networks and frame relay. In addition, several carriers have announced substantial decreases in the price of established services, such as international telephone and private leased circuits. Cable & Wireless-Mercury Communications, Ltd. recently reduced the tariff for their half of transatlantic private leased circuits up to 53% for speeds above 128K bit/sec.

As a result of this activity, the announcement of new global networking ventures can be expected during the coming months. One or more of these ventures could also include major non-PTT players such as IBM, Electronic Data Systems Corp. or Arthur Andersen & Co.

In the fall of 1992, IBM announced a joint venture named Advantis with Sears Roebuck & Co. The new firm combines the systems and networks maintained by Sears with IBM's data outsourcing subsidiary, Integrated Systems Solutions Corp.

If Advantis fares well, it would provide IBM with the option of expanding its size and scope of operation to include other carrier and non-carrier partners.

Issues remain

In addition to the PTTs, many other service providers have developed — or are in the process of developing — international telecommunications offerings. Often, these service providers operate as value-added carriers or network integrators. Underlying their services are private leased circuits or public switched services obtained from one or more PTTs and established international carriers.

PTTs and carriers compete with these "network integrators," and value-added carriers for the global network business of multinational companies. Each must often respond to a customer request for proposal.

> Users may have difficulty keeping track of the players and their respective ventures.
>
> ▲▲▲

In preparing their responses to customer RFPs, the PTTs are able to quote whatever discount they feel is justified in order to win the client's business. Other service providers must rely on either the standard carrier filed rates or whatever they project will be the rates they can negotiate with the U.S. carriers.

The issue here is whether it is fair for a PTT or regulated carrier to compete with value-added carriers, network integrators or other third parties.

Of course, there is a reverse issue, as well. To countries where resale is allowed, value-added carriers and network integrators can offer multiplexed bandwidth at rates well below even discounted carrier rates.

Another complication to be considered is where one PTT or carrier sets up a specialized or value-added venture outside its own service area. An example of this activity is IDB Communications Group, Inc. (previously World Communications, Inc.) and AT&T, which have both set up wideband digital networks between major European gateways to offer various services in competition with the local PTTs.

During the next few years, more complex ventures between PTTs and carriers, value-added network vendors and perhaps equipment vendors will surface. These ventures will create new questions and issues for regulators and government agencies that deal with competition.

Developed countries such as the U.K., France, Germany and Japan will have to address such subjects as the cross-subsidization of services, access and connection between PTTs and specialized service companies, rates and tariffs.

Venture forecast

By the mid- to late 1990s, it is likely that there will be three or four superconsortiums of PTTs and vendors with a fully developed set of services and support offices.

Ultimately, PTT and carrier venturing may well change the structure of global public and private networks. By the end of this decade, both corporate and residential users may be doing business with one of several international supercarriers for everything other than local service requirements.

The size and structure of such supercarriers, combined with their equally large capital investment requirements, will make it difficult for them to focus on the applications and requirements of individual users — a situation not uncommon today.

In addition, the pressure to achieve market share will require that such supercarriers engage other organizations to feed them business. As a result, while the supercarriers will attempt to maintain direct control of the business of large users, there will probably be a need for specialized companies that can operate as retailers, resellers or aggregators of supercarrier services to mid-sized and small customers.

During the next few years, users will witness the early phases of PTT partnering and may have some difficulty keeping track of all of the players in the marketplace and their respective ventures and relationships. It will also be difficult to determine which offered services are fully implemented, partially implemented or hardly off the drawing board.

As a final note, some users may find that outsourcing their international networks to one of the new PTT ventures or partnerships will offer a sound way to deal with the maintenance of a cost-effective, well-managed international network. Others may find direct control of their own international network to be more beneficial.

In any case, PTT partnering and new PTT ventures will provide users with new options not currently available.

Elfenbein is president and chairman of Lynx Technologies, Inc., a Little Falls, N.J., consultancy specializing in international networks.

FCC irons out 800 questions

continued from page 19

istrative details have had to be worked out.

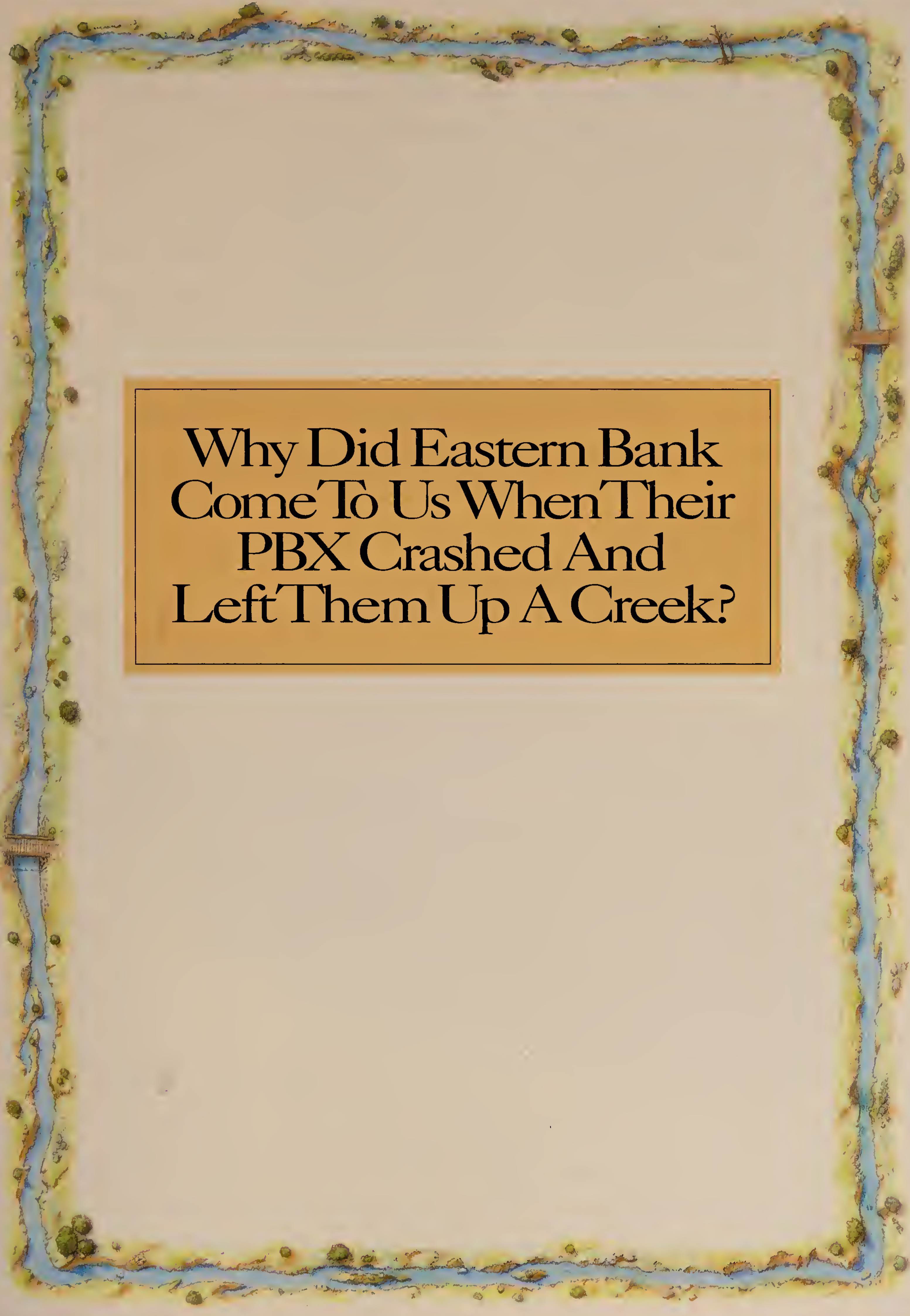
The FCC's decision last week to mandate area-of-service routing was an important win for users. Area-of-service routing enables a company to have its 800 traffic routed to a long-distance carrier based on the point of origin of the call. This will enable users to divide 800 traffic among several long-distance carriers or allow a gradual area-by-area cutover to portable 800 numbers.

Until last week's ruling, area-of-service routing was considered an optional feature and users had told the FCC they were afraid that some carriers would not provide it. The FCC's decision to include it as a basic feature of 800 portability also means that users will not be assessed an additional charge for the capability.

User groups such as the Ad Hoc Telecommunications Users Committee had told the FCC that unless area-by-area routing was available ubiquitously, 800 portability would be almost useless.

"For a huge number of applications for hundreds of users, a flash cut to a new carrier on a nationwide basis simply is not feasible," the group stated in filings at the FCC.

The FCC last week also decided that users may act on their own behalf to contact local carriers and notify them that 800 traffic will be switched to a new provider. Before this ruling, it appeared that only carriers — and possibly only long-distance carriers — would be allowed to make such changes. That raised user concerns that carriers would drag their feet when asked to switch a user's 800 traffic to a competitor.



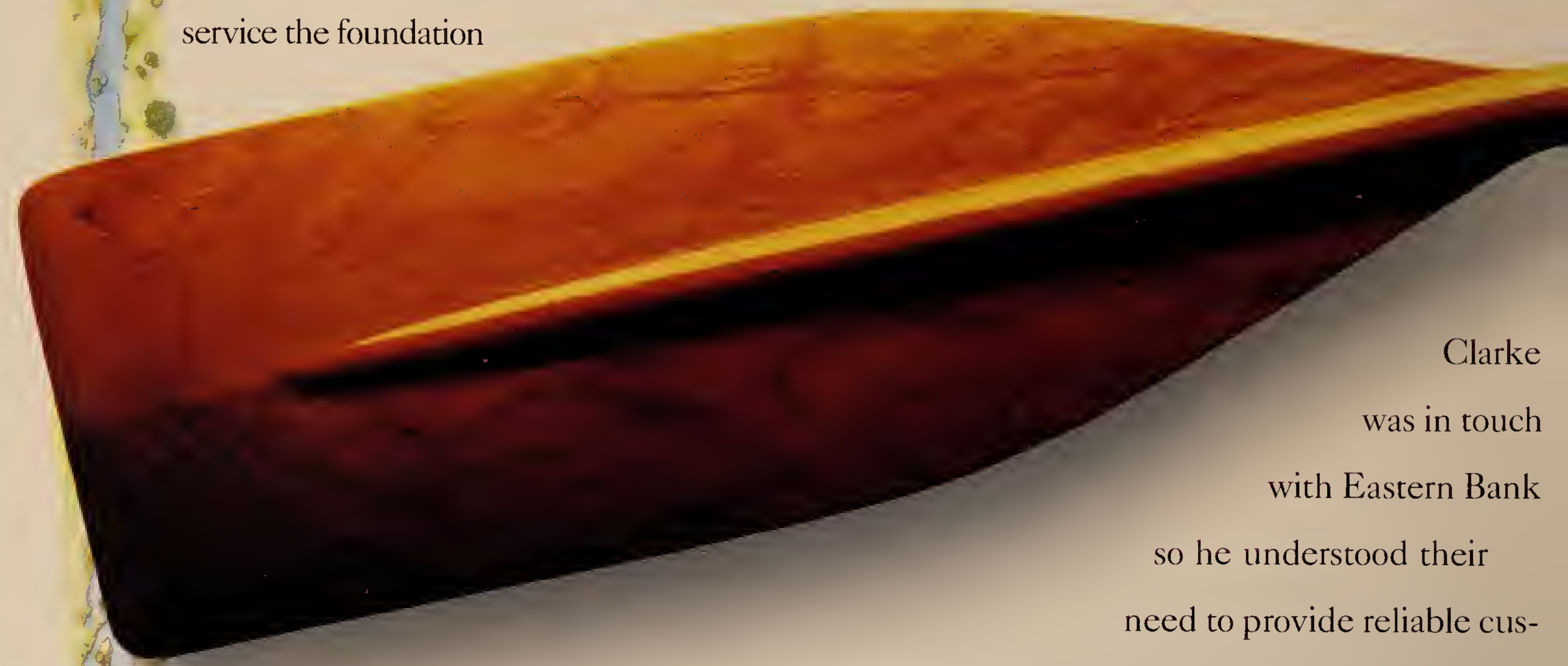
Why Did Eastern Bank Come To Us When Their PBX Crashed And Left Them Up A Creek?

We Had Exactly What They Were Looking For.

To Eastern Bank the most crucial aspect of their business is customer service. They've learned it's an important way to differentiate themselves from the competition. As Eastern Bank President Stanley Lukowski says, "Our success is measured in terms of our ability to meet individual requirements."

So they've made customer service the foundation of their business. As a result, they've become the largest independent commercial bank on Boston's North Shore.

Eastern Bank knew that to continue to grow, however, they'd need to provide even more services by phone. And to do that they'd need a more reliable phone system. They began reviewing proposals, including one from New England Telephone.

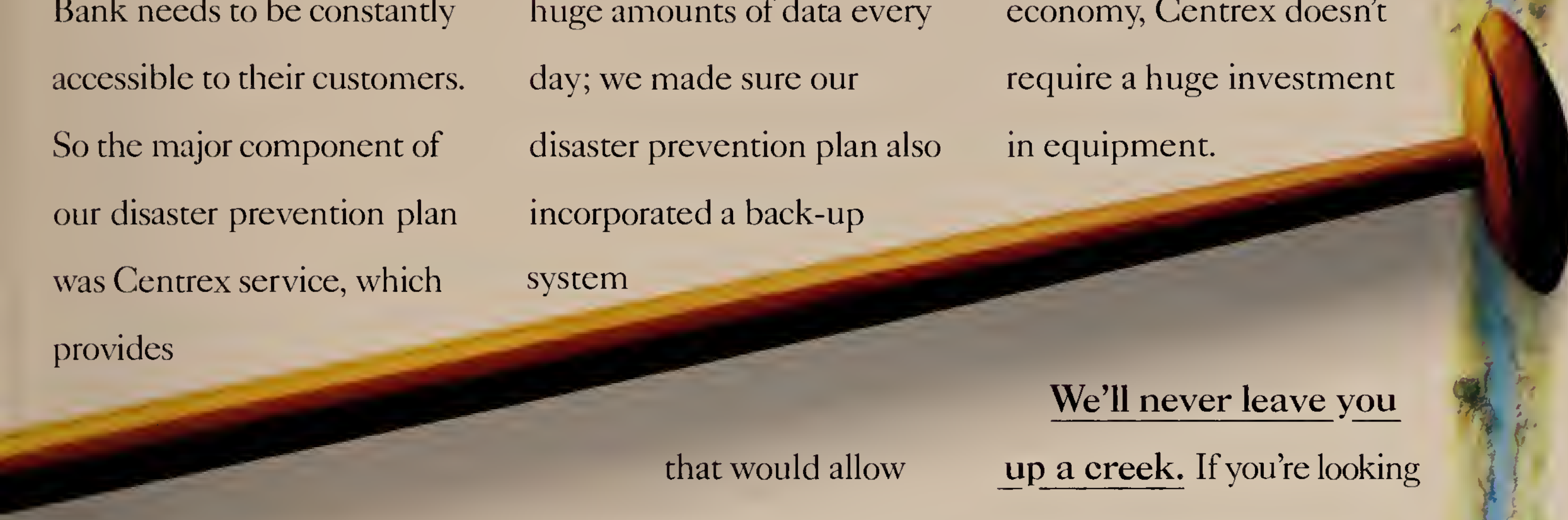


And then disaster struck. One of the bank's PBXs crashed. They couldn't get any calls in or out of their busy Salem office. So they immediately set up a bank of cellular phones to keep in touch with customers. And then they had to wait two days for the service company to fix their PBX. Eastern Bank needed to make sure that this never happened again.

So they called New England Telephone. **We knew their business.** New England Telephone Senior Account Executive John Clarke was in touch with Eastern Bank so he understood their need to provide reliable customer service. As a result, the team he had set up–Tom Dwyer, Sales Manager; Paul Gallagher, Project Director; and Dan Tonelli, Systems

Analyst – had designed a telecommunications system for the bank that incorporated an unbeatable disaster prevention plan. So Eastern Bank went with our proposal.

Disaster prevention for voice and data. Eastern Bank needs to be constantly accessible to their customers. So the major component of our disaster prevention plan was Centrex service, which provides



back-up for Eastern Bank's voice lines. If there's a problem at the main site and calls can't get through the bank's main number, they're quickly re-routed to another of their locations. And because we maintain the entire Centrex system out of our Central Office, service won't be affected by a power outage.

Eastern Bank processes huge amounts of data every day; we made sure our disaster prevention plan also incorporated a back-up system that would allow them to move data – even if there's a failure at the main site. So they're better able to serve their customers.

Eastern Bank
Lynn, MA
Assets over $1 billion
Products and Services Offered: Full Service Bank
Need: A reliable telecommunications system to help provide innovative customer service.
Solution: A complete disaster prevention plan that incorporated Centrex.

Flexibility for changing times. We helped Eastern Bank improve customer service in other ways, too. For example, Centrex gives them the flexibility to rearrange lines, or even temporarily expand services to accommodate changing needs.

Unlike a PBX, Centrex never becomes obsolete. New England Telephone is continually upgrading the system's software and adding services, so Centrex can grow with your business. Equally important in today's economy, Centrex doesn't require a huge investment in equipment.

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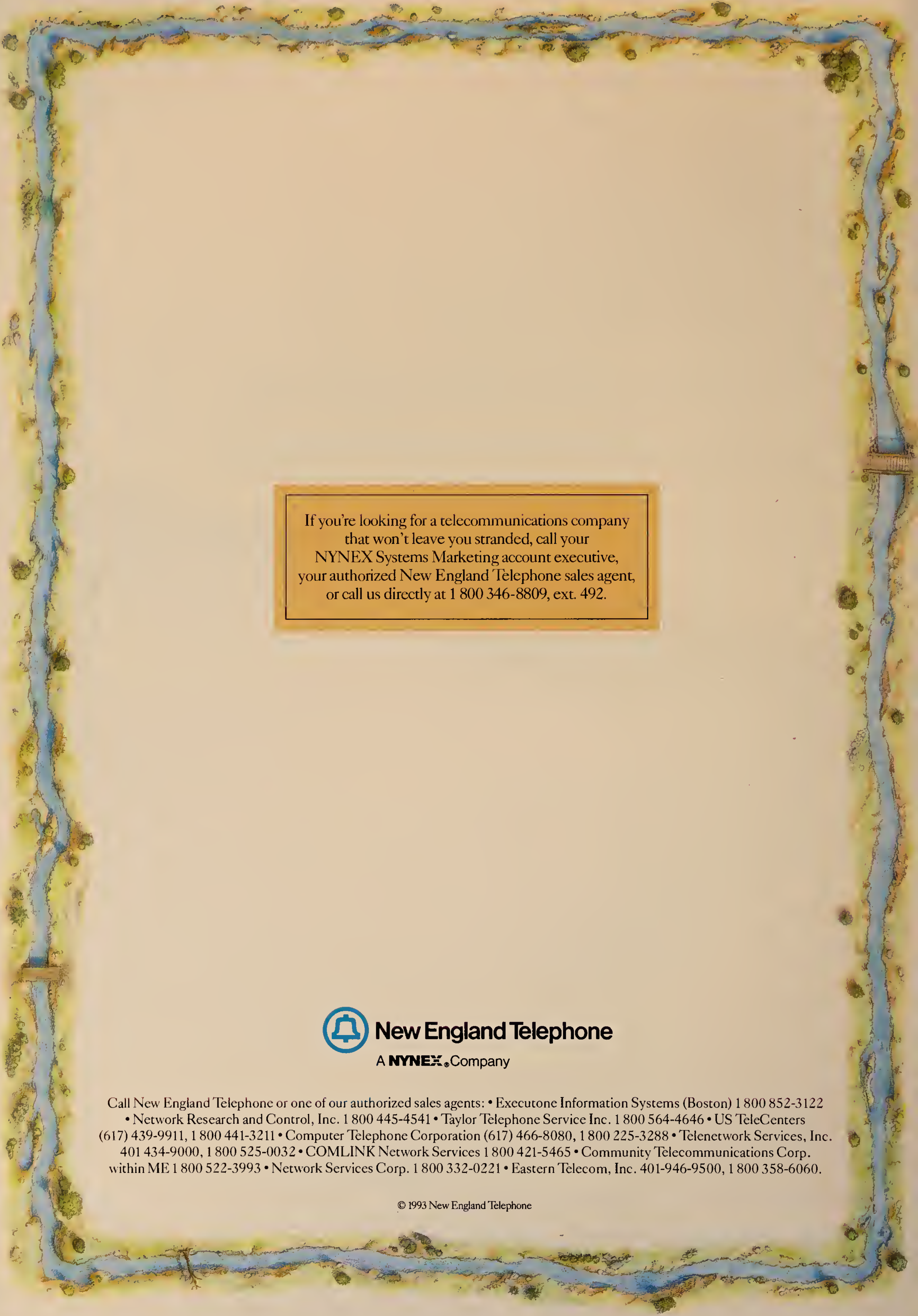

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Call New England Telephone or one of our authorized sales agents: • Executone Information Systems (Boston) 1 800 852-3122 • Network Research and Control, Inc. 1 800 445-4541 • Taylor Telephone Service Inc. 1 800 564-4646 • US TeleCenters (617) 439-9911, 1 800 441-3211 • Computer Telephone Corporation (617) 466-8080, 1 800 225-3288 • Telenetwork Services, Inc. 401 434-9000, 1 800 525-0032 • COMLINK Network Services 1 800 421-5465 • Community Telecommunications Corp. within ME 1 800 522-3993 • Network Services Corp. 1 800 332-0221 • Eastern Telecom, Inc. 401-946-9500, 1 800 358-6060.

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ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

> "Self-proclaimed standards never work. You often see people get together to make something a standard; they send out press releases, but nothing ever comes of it."

Michael Zisman
President
Soft-Switch, Inc.
Wayne, Pa.

Store & Forward

Microsoft Corp. recently began shipping free of charge a beta version of Object Linking and Embedding (OLE) 2.0. Due out next quarter, OLE 2.0 allows users to edit objects within documents without switching to a different window, and drop objects inside other objects, among other things. OLE 2.0 will support Macintosh and Windows NT platforms in the third quarter.

Lotus Development Corp. recently began shipping a gateway that enables users to exchange messages between cc:Mail and Simple Mail Transport Protocol (SMTP) electronic mail systems. Called cc:Mail Link to SMTP 2.0, the gateway supports up to five channels. Available now, cc:Mail Link to SMTP 2.0 costs $3,495.

Fischer International Systems Corp. recently began shipping software that automates the flow of paperwork or forms across multiple operating environments. WorkFlow 2000 lets developers using the REXX language build programs into electronic messages that automatically carry out tasks or activities. WorkFlow 2000 is available now for IBM mainframes and will soon be out for DOS, Windows, Macintosh and Unix.

D&B, PeopleSoft intro new wares in client/server push

Offer financial applications, product upgrades.

By Wayne Eckerson
Senior Editor

Dun & Bradstreet Software (D&B) and PeopleSoft, Inc. recently squared off in the client/server application market by announcing new financial applications and upgrades to existing products.

Atlanta-based D&B Software said it plans to introduce in June a set of client/server financial applications, called FinancialStream, as well as a major upgrade of its client/server platform that incorporates transaction processing and work flow capabilities.

PeopleSoft, based in Walnut Creek, Calif., said it will deliver by year end new modules for its client/server accounting system and human resources package.

D&B Software's FinancialStream is a set of Microsoft Corp. Windows-based applications that handle ledgers, invoices, payments, receivables, assets and remittances. The company developed FinancialStream — as well as its forthcoming human resources, distribution and manufacturing applications — from the ground up using enterprise modeling and design techniques, said Robert Cameron, director of strategy and business development for D&B Software.

The firm's client/server applications are built on top of a new version of SmartStream, which incorporates work flow technology — purchased last year from Powersoft Corp. — and Microsoft's Access, a personal computer database and query tool.

SmartStream applications, such as FinancialStream, work with Sybase, Inc.'s SQL Server database and support any messaging system conforming to Microsoft's Messaging Application Programming Interface.

The work flow component of SmartStream 2.0, called Activity Manager, uses messages, stored procedures and triggers, as well as Sybase remote procedure calls, to create business rules and agents that automate tasks or entire business processes, such as purchasing or inventory.

For example, a manager can use FinancialStream to create an agent that automatically approves expense reports submitted by certain employees but holds other reports for detailed examination. Also, FinancialStream automates invoice payment tasks, such as obtaining a

(continued on page 22)

Navigator 2.0 helps users build client/server apps

LAS COLINAS, Texas — Ernst & Young last week introduced a new version of its Navigator Systems Series methodology that assists users in building client/server applications.

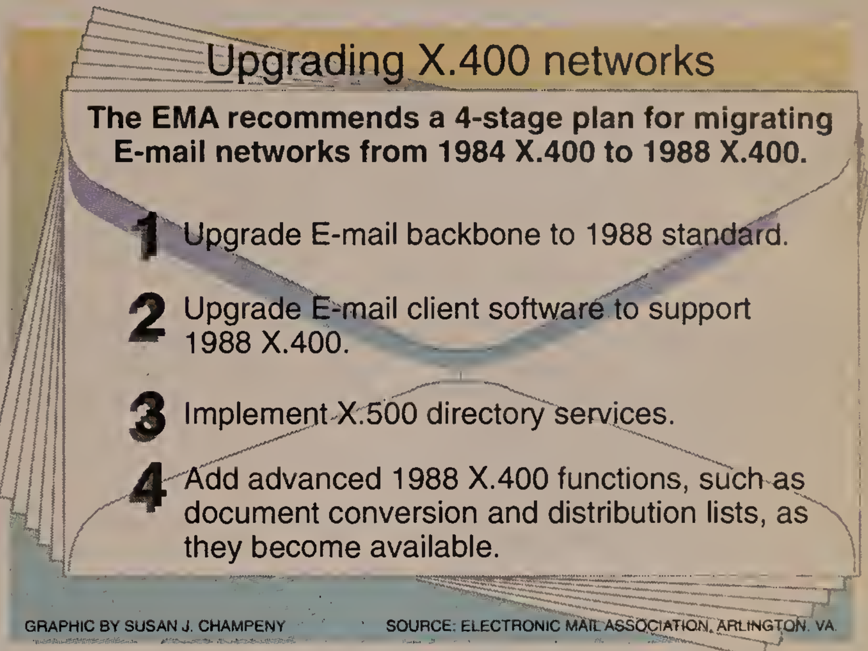
Version 2.0 transforms the Navigator from a series of paper documents to an object-based repository that supports interactive desktop training and a team environment for developing client/server applications.

The tool supports an Automated Methods Environment consisting of three modules. The Project Planning Assistant lets developers use the Navigator repository to build a detailed project plan, including project charters and risk management strategies.

The Enterprise Standards Assistant allows an organization to customize the Navigator repository to reflect the terminology it uses to describe operations, as well as procedures and policies unique to that organization.

The Performance Support Assistant gives analysts and programmers complete on-line access to the Navigator methodology. It also provides hooks to computer-aided software engineering tools from KnowledgeWare, Inc. and Texas Instruments, Inc., and gives specific guidelines for developing applications using Powersoft Corp.'s PowerBuilder.

Available now, a Navigator license costs $65,000, and the software costs about $10,000, depending on configuration.



Upgrading X.400 networks

The EMA recommends a 4-stage plan for migrating E-mail networks from 1984 X.400 to 1988 X.400.

1. Upgrade E-mail backbone to 1988 standard.
2. Upgrade E-mail client software to support 1988 X.400.
3. Implement X.500 directory services.
4. Add advanced 1988 X.400 functions, such as document conversion and distribution lists, as they become available.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: ELECTRONIC MAIL ASSOCIATION, ARLINGTON, VA

1988 X.400 cutover has benefits, risks

EMA white paper outlines advantages, pitfalls of migration; offers four-stage implementation plan.

By Wayne Eckerson
Senior Editor

ARLINGTON, Va. — The Electronic Mail Association (EMA) has published a white paper that examines the risks, costs and benefits of migrating from the 1984 version of X.400 to the 1988 version and presents a four-stage model for implementing the upgrade.

Written by Daniel Blum, a principal with the consulting firm Rapport Communication, the white paper is designed to help users recognize obstacles and keep risk and costs to a minimum as they migrate to 1988 X.400.

"Leveraging X.400 and X.500 will not be as simple as throwing a switch or installing a single product," the report states. "The migration cannot occur in a month or even a year for the typical enterprise. It will not be easy, but it can be done."

The 1988 X.400 version offers significant enhancements over the 1984 version, making it worthwhile to upgrade or move more fully to standards-based messaging. The enhancements include support for multimedia and revisable documents, X.500 directory services, document conversions, improved security and audit capabilities, and a host of new delivery options.

But to gain these benefits, users will incur costs when upgrading their nets to support the standard. These expenses cover the cost of training developers, educating end users, devising a migration strategy, and evaluating, purchasing, implementing and maintaining new software and systems.

Users would incur many of these costs in implementing any new E-mail system, the report says. But unlike upgrading to a new version of a vendor's E-mail product, migrating from the 1984 X.400 version to the 1988 version exposes users to potential interoperability problems.

> "Leveraging X.400 and X.500 will not be as simple as throwing a switch."

▲▲▲

For example, users cannot be certain that products based on the 1988 and 1984 versions of X.400 will interoperate. Even products based on the 1988 version may not interoperate. These problems will increase the amount of time users spend troubleshooting and may cause end users to lose confidence in the system if new messaging features fail to work as promised.

To minimize the risks of migrating to 1988 X.400, the EMA recommends users follow a four-stage implementation model

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D&B, PeopleSoft intro new wares

continued from page 21

supervisor's approval for the payment, updating an asset database and notifying accounts payable.

According to Cameron, Activity Manager does not route documents the way some work flow packages do. Instead, it uses rules-based logic to select information from SQL Server databases and funnel it into predefined activity and event screens viewed by users.

The firm architected SmartStream so most of the application logic runs on the SQL Server. "Our goal is to maximize what happens on the server in order to minimize network traffic between clients and servers," he said.

A different approach

In contrast, PeopleSoft's Windows-based applications offer users the option of running application logic on servers or clients.

"Some large-scale enterprise applications will necessitate running logic on servers, but there are many other applications in which it is best to put the logic on a single user's PC," said Richard Bergquist, vice president of technology at PeopleSoft.

In addition, PeopleSoft applications work with a variety of database management systems, not just Sybase's SQL Server. PeopleSoft applications run on Sybase's SQL Server, Gupta Corp.'s SQLBase, Hewlett-Packard Co.'s Allbase/SQL, Oracle Corp.'s Oracle, Digital Equipment Corp.'s Rdb and IBM's DB2.

"We want to give customers the flexibility of using our applications with any product or technology they want, rather than boxing them into any one set of products," Bergquist said.

PeopleSoft is planning to deliver payables, receivables and asset management modules for its PeopleSoft Financials client/server accounting system. The company shipped a general ledger application last fall.

PeopleSoft is also adding two new benefits applications to its human resource system, HRMS 3.0, and enhancing its payroll and employee management software.

> "We want to give customers the flexibility of using our applications with any product or technology they want, rather than boxing them into any one set of products."

▲▲▲

In addition, the company announced it would license its PeopleTools client/server development tool kit to customers that want to use it to develop other client/server applications.

Pricing for PeopleSoft Financials ranges from $100,000 to $300,000 per module. PeopleSoft HRMS costs between $130,000 to $800,000, depending on modules purchased and the number of users and platforms supported. ◪

1988 X.400 cutover has benefits, risks

continued from page 21

(see graphic, page 21).

The model suggests that users migrate their backbone E-mail nets to the 1988 version before implementing X.400-compliant user agents. Unless the backbone net is in place, end users will be unable to exchange multimedia messages or take advantage of other 1988 X.400 capabilities in their client software.

After implementing the 1988 X.400 backbone and client software, users should implement X.500 directory services followed by advanced X.400 features, such as document conversion, distribution lists, redirection and enhanced security.

The report recommends users implement 1988 X.400 capabilities throughout an entire message domain in order to maximize component interoperability. When this is not possible, it suggests techniques for supporting some 1988 X.400 capabilities across a 1984 X.400 backbone.

Users with complex messaging networks consisting of multivendor E-mail systems and gateways most likely will not be able to implement 1988 X.400 in a single cutover. Staggered implementations of 1988 X.400 will also be dictated by the availability of products and urgency of user requirements.

The EMA report is available for $45 for nonmembers and $20 for members by calling (703) 765-8620. ◪

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

The number of mergers and acquisitions in the U.S. information technology market fell to 530 in 1992, down 9% from the year before, according to a study by Broadview Associates, L.P., a Fort Lee, N.J., mergers and acquisitions firm. The total dollar value of the deals dropped 26% to $21 billion, the study said.

People & Positions

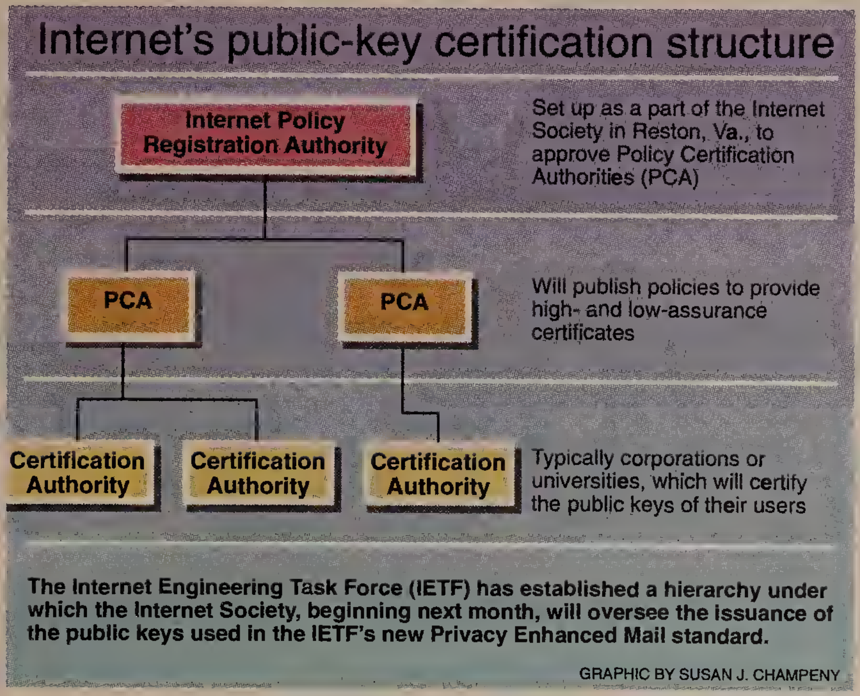
VMX, Inc., a San Jose, Calif., voice processing equipment and software vendor, last week named **George Kendall** to the newly created position of vice president of European operations for the company.

In his new position, Kendall will manage all of VMX's European operations and be based at the company's European headquarters in Maidenhead, U.K.

Previously, he was managing director of Municipal Mutual Computing, a facilities management company in the U.K.

Marc Jones last week was named president of **Madge Networks, Inc.**'s North American operations in San Jose, Calif. Jones will be responsible for expanding the U.S. and Canadian operations of Madge Networks, a vendor of token-ring products.

Previously, Jones was senior vice president and general manager of integrated systems products at Chips and Technologies, Inc., a semiconductor vendor located in San Jose.


Internet's public-key certification structure
Internet Policy Registration Authority
Set up as a part of the Internet Society in Reston, Va., to approve Policy Certification Authorities (PCA)
PCA
PCA
Will publish policies to provide high- and low-assurance certificates
Certification Authority
Certification Authority
Certification Authority
Typically corporations or universities, which will certify the public keys of their users

The Internet Engineering Task Force (IETF) has established a hierarchy under which the Internet Society, beginning next month, will oversee the issuance of the public keys used in the IETF's new Privacy Enhanced Mail standard.

GRAPHIC BY SUSAN J. CHAMPENY

Group devises new system for public-key certification

Companies, academia vying for IPRA status.

By Ellen Messmer
Senior Correspondent

RESTON, Va. — By the end of March, the Internet Society, based here, plans to establish an elaborate system for public-key certification, and a number of companies in the security industry intend to play a big role in it.

The new three-tiered administrative hierarchy (see graphic, this page) will provide corporations and universities with a way to issue end users the equivalent of electronic identification badges for the public keys used in encryption.

The certification system, detailed in the new Privacy Enhanced Mail (PEM) standard, is aimed at deterring fraudulent use of public keys for digital signatures and encryption ("IETF OKs standard for encryption," *NW*, Feb. 15).

Public-key technology relies on two keys — one published and the other private. Electronic documents are encrypted using the intended recipient's public key and decrypted by the recipient using the private key.

For several years, the Internet Engineering Task Force's PEM group wrestled with the prickly question of how to assure that the public key belongs to the person claiming it.

The Internet Society's newly created Internet Policy Registration Authority (IPRA) is now reviewing proposals from industry and academia on ways to assure the authenticity of public keys. The IPRA will grant the status of Policy Certification Authority (PCA) to any organization that devises methods for assuring either a high or low level of assurance in public key usage.

PCAs will be authorized to issue electronic certificates to corporations, universities or casual end users under the published guidelines. These organizations, designated as Certification Authorities by the PCA, will be able to distribute two-year certificates to end users of public-key encryption. Steve Kent, chief scientist at BBN Communications Corp., said the electronic certificates contain the user's name and public key, as well as other information such as the serial number of the issuing organization.

Kent noted that the Internet's hierarchical system will allow users and organizations to report required changes in certificates. But he added that revocation of certificates does not nullify the user's public key per se, but rather severs the binding between the user's ID and the public key.

The multiple layers of certification are intended to boost security of the system and provide a means for centralized reporting of fraudulent public key use.

Seeking certification

RSA Data Security, Inc. would like to be selected as a PCA for low- and high-assurance certification. Under the high-assurance plan that RSA has submitted to the IPRA, organizations would have to use hardened, tamper-

(continued on page 27)

E-mail industry to set mgmt. standards

IFIP basing its efforts on existing CCITT, IETF documents; group is asking for industry comment.

By Bob Brown
Senior Editor

An International Federation for Information Processing (IFIP) working group is moving rapidly to assemble a comprehensive set of standards for managing multivendor electronic mail networks.

Such standards will help vendors build management products that meet user needs for designing and controlling enterprise mail networks comprising mail systems from a variety of suppliers. Today, there is a dearth of products for managing multivendor E-mail nets, and many users have been forced to build their own tools ("Users demanding help in managing big E-mail nets," *NW*, Feb. 8).

Stefferud

IFIP, a global society for computer and communications industry professionals, is sponsoring the Electronic Mail Management (EMGT) Group, which operates under IFIP working groups 6.5 and 6.6. The EMGT Group plans to pump out a user requirements document, an E-mail management model document and definitions of objects to be managed.

EMGT Group members plan to put a draft user requirements document on the Internet for comment by the end of this month. Members hope to have a draft user requirements document ready by midyear to send to international standards bodies, as well as a draft document of an E-mail management model, which will describe how E-mail management will work. The object work will kick into high gear once the other efforts are further along.

Once work is completed on these efforts, results will be fed into appropriate standards bod-

(continued on page 27)

INDUSTRY BRIEFS

Security conference on tap. The Sixth International Computer Security & Virus Conference will be held in New York March 10-12. Information about the conference, which will present a series of five simultaneous sessions each day on virus and toll fraud prevention, encryption and security products, can be obtained by calling (800) 835-2296, Ext. 190.

EDS passes $8 billion mark. Electronic Data Systems Corp. (EDS), a Dallas-based systems integrator, reported $8.2 billion in 1992 revenue, a 16% increase over its 1991 revenue. Earnings rose 16% from $547.5 million in 1991 to $635.5 million in 1992. For the fourth quarter ended Dec. 31, EDS reported $2.1 billion in revenue, up $2 billion for the same quarter last year. Earnings for the fourth quarter were $278.9 million, up about 13% from the same period in 1991.

Proteon rings up revenue, earnings. Proteon, Inc., a Westborough, Mass., router and local-area network equipment vendor, posted 1992 revenue of $120.3 million, up 27% from the previous year. The company reported 1992 earnings of $6.5 million, up from $6.3 million in 1991. For the fourth quarter, Proteon reported revenue of $31.6 million, up 11% for the same period in 1991.

Banner year for Informix. Menlo Park, Calif.-based relational database vendor Informix Software, Inc. reported a

(continued on page 27)

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Track 3 - Winning the Midrange Wars

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- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with NT Looms
- Midrange Contradictions

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Charles Ashley
Director of data processing
technical services
Texas Employment Commission
Austin

Manager Minutes

If you're spending more and more time supporting Microsoft Corp. Windows and trying to integrate Windows desktops into your network environment, you and your end users will probably benefit from **Desktop Images, Inc.**'s "Understanding the Microsoft Windows 3.1 operating system" video tutorial.

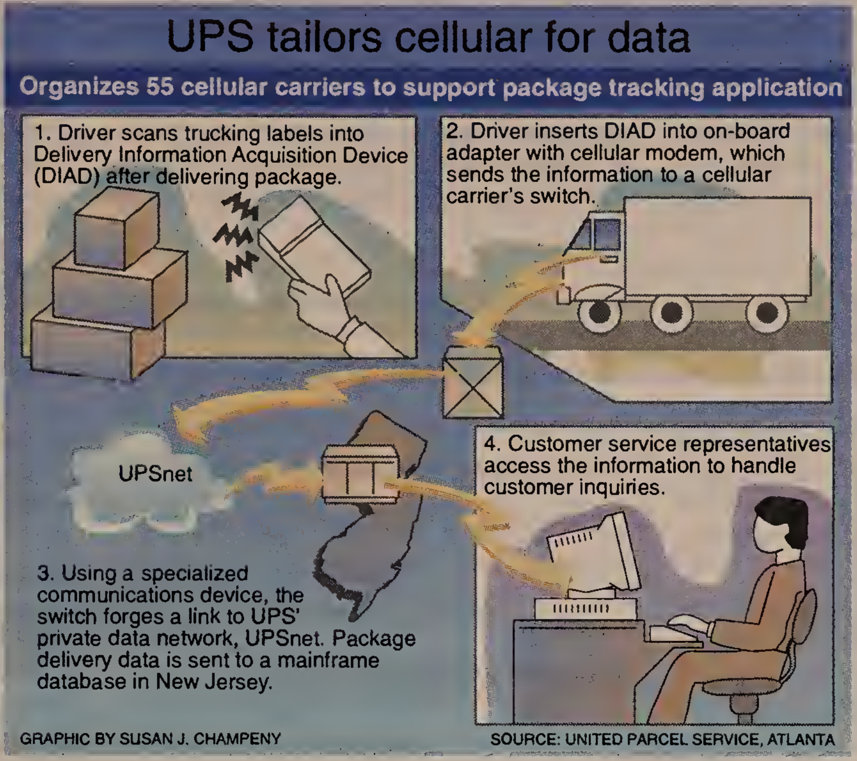
The video is designed for new and advanced Windows users. Structured in eight sections, it covers mouse operations, Windows elements, program manager, file manager, print manager, the Windows control panel, integrating Windows applications and Windows help.

The video costs $49.95. For information, call Desktop Images at (303) 745-6212.

The **National ROLM Users Group (NRUG)** will hold its semiannual spring conference April 19-23 in Fort Lauderdale, Fla.

The conference will feature daylong Rolm-sponsored tutorials on PhoneMail, Security, Call Path and CallBridge, as well as management and technical sessions and telecommunications product strategy sessions.

For more information, call NRUG at (312) 321-6804.


UPS tailors cellular for data

Organizes 55 cellular carriers to support package tracking application

1. Driver scans trucking labels into Delivery Information Acquisition Device (DIAD) after delivering package.

2. Driver inserts DIAD into on-board adapter with cellular modem, which sends the information to a cellular carrier's switch.

3. Using a specialized communications device, the switch forges a link to UPS' private data network, UPSnet. Package delivery data is sent to a mainframe database in New Jersey.

4. Customer service representatives access the information to handle customer inquiries.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: UNITED PARCEL SERVICE, ATLANTA

UPS cajoles carriers into teaming to offer service

Cellular carriers join in nationwide wireless net.

By Joanne Cummings
Senior Writer

ATLANTA — Competition and cooperation are usually mutually exclusive terms. But when you factor in a user company set on deploying a unique application to support its business, competitors can sometimes be convinced to cooperate.

Such was the case when United Parcel Service (UPS) got 55 competing cellular carriers to join forces in building a nationwide data network to support a wireless, mobile package tracking application for the company.

"The cellular carriers had been talking about offering data services for a while," explained Paul Heller, systems manager for mobile networks at UPS, based here. "But cellular's a pretty fragmented industry. What they needed was a catalyst to help unify the effort, and that's where UPS came in."

UPS' package tracking application, which went live nationwide last week, enables drivers to enter up-to-date package delivery information, such as time of delivery and who signed for a package, into the firm's central mainframe database while the drivers are still on their delivery routes.

This enables UPS customer service representatives to handle customer inquiries about package shipments on the day of delivery. Before, the information was uploaded to the mainframe overnight and was unavailable until the day after delivery.

When drivers deliver a package, they capture delivery information, including the recipient's signature, with a handheld pen-based computer called a Delivery Information Acquisition Device (DIAD). The DIAD is popped into a DIAD Vehicle Adapter in the truck, which contains a cellular modem that sends information to a switch in the cellular network.

UPS has collocated with every switch in the participating carriers' networks a device from Primary Access Corp. that is a combination modem pool, T-1 interface and packet assembler/disassembler. The device takes incoming data and dumps it into UPS' private T-1 network, called UPSnet, for delivery to the data center (see graphic, this page).

Bill consolidation

The carrier alliance provides UPS with common data network access across carrier regions, as well as a common level of service parameters, including a virtual numbering plan and guaranteed cellular call durations of less than 15 seconds. It also gives UPS common billing.

"The carriers have set up an agency that consolidates all the billing," Heller said. "UPS receives one consolidated bill and then issues a single remittance. The agency then disseminates the payment to the various carriers."

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MANAGING TECHNOLOGY

BY DAVID FERRIS

How will Windows NT affect networking?

Microsoft Corp.'s Windows NT is due out over the next few months, and I've been exploring a beta version of the product, together with its companion, LAN Manager for Windows NT. Some initial observations are that it should prove to be a powerful workstation operating system and a good special-purpose server network operating system (NOS), but if it's going to be truly successful, Microsoft should kill off LAN Manager for Windows NT and fold its capabilities into NT.

In terms of NT's networking capabilities, its most important new utilities are a performance monitor; an event viewer that provides a central mechanism for recording important network events; a backup utility for servers and workstations; a disk manager for viewing, creating and deleting partitions; a user manager to provide for multiple users of the same machine; and uninterruptible power supply support.

In addition, it will offer a wide selection of connectivity options. You can use Network Basic I/O System Extended User Interface, which ships with NT, or Transmission Control Protocol/Internet Protocol as a transport. Microsoft also plans to offer TCP/IP utilities such as File Transfer Protocol and Telnet, as well as an NT-based Systems Network Architecture gateway and Apple Computer, Inc. Macintosh integration. And Digital Equipment Corp. has said it will provide connections to VAX and Ultrix machines with its own NT version of Pathworks.

In effect, Microsoft has taken

(continued on page 26)

EXECUTIVE BRIEFS

Handling the flow. The Association for Information and Image Management (AIIM) has published "Workflow in Imaging Systems," a guide to redesigning work flow to take advantage of document imaging technology.

The book describes how to retool a firm's current work flow procedures to maximize productivity, identify opportunities for the highest return on investment and cost-justify the redesign effort. A discussion on design and management tools for optimizing imaging performance and the impact a redesign has on organizational structure is also included.

"Workflow in Imaging Systems," catalog number C123, costs $20 for AIIM members and $25 for nonmembers. For more information, call AIIM at (301) 587-8202.

Client/server schooling. Andersen Consulting's Foundation software unit, a manufacturer of client/server application developer tools, and James Martin Insight, Inc., a developer of informational and educational media on emerging technologies, this month will release three jointly developed video courses to help users migrate to client/server architectures: "Evaluating Readiness for Client/Server Computing," "GUI Design" and "Cooperative Principles."

For more information, contact Andersen Consulting at (312) 507-8835 or James Martin Insight at (708) 983-4808.

How will NT affect networking?

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various networking features out of OS/2 LAN Manager and bundled them with Windows. This makes a lot of sense because today's workstations need networking intelligence. But there are still a couple of important features missing, such as user-based security and account management.

LAN Manager for NT fills some of the gaps. For example, NT uses what is often called a "share-based approach" to security. This means users protect resources by giving them a name, a password and corresponding access privileges.

But for production environments, it's better to have user-based security, where access to resources is defined by the user or user group, and users only provide a single password when they log on. LAN Manager for NT has user-based security, as do competing NOSes such as Novell, Inc.'s NetWare and Banyan Systems, Inc.'s VINES. LAN Manager for NT also offers NOS-quality account controls. You can perform such tasks as defining user profiles, limiting logons to particular workstations or times, enforcing password maintenance policies and defining logon scripts.

But trying to get users to fork out a few more dollars for LAN Manager for NT isn't the way to go. Microsoft should simply kill LAN Manager for NT and fold its remains into NT.

Nevertheless, let's assume Microsoft continues to sell NT and LAN Manager for NT as two separate but complementary products. How will NT affect the networking world?

First, independent software vendors are currently making large investments in NT-based software. Although NT requires high-end workstations with 12M bytes of random-access memory and 100M bytes of disk space recommended, the relentless improvements in hardware and the lure of NT-based applications should fuel its use as a workstation operating system.

The server environment also looks good. Today, most of us put NetWare in file and print servers, and DOS into more specialized servers such as 3270 gateways, mail routers and facsimile gateways. Unix is often used for database servers.

NT is an attractive server environment for several reasons. It is multitasking, has preemptive scheduling and it insulates different tasks from one another, simplifying debugging and limiting the damage that can be caused by programs running amok. It also has 32-bit virtual memory — which makes programming a lot simpler — and its application program interfaces are extensive and well thought out.

In addition, the learning curve for existing Windows programmers is flat — they can use the compilers, debuggers, editors and other development tools they already know. A wide variety of development tools are already becoming available.

And putting NT on servers will simplify the support effort because you'll have the same architecture and management utilities on both servers and workstations. This is a lot better than today's situation, where network servers and workstations each have their own management utilities. It's an incredible waste of time and brain cells to fiddle with integrating NetWare and Windows print drivers, for example.

But there are some shortcomings that need to be addressed. When it comes to the main features we look for in a NOS — directory, file and print services — Windows NT hits some snags so its initial release won't present an immediate threat to NetWare, LAN Manager or VINES file servers.

In addition to its lack of user-based security and advanced account management, NT badly needs a distributed directory, something along the lines of Banyan's StreetTalk. And it needs a more flexible multipart naming convention.

Special-purpose servers

Finally, let's consider NT as a platform for special-purpose servers such as database servers, mail routers, 3270 gateways and modem pools. Based on conversations with a lot of independent software vendors and corporate users working with beta versions of the product, things look good for NT here.

Nobody seems to be complaining, and most people's attitudes vary from getting-on-with-business to enthusiasm. No doubt, early versions will reflect NT's youth, and plenty of polishing can be expected over the first couple of years. Better low-level control of I/O and system parameters will be necessary. But if NT were a dog, we'd have heard about it by now.

So what conclusions can we tentatively draw about NT? The growing application market will make NT attractive for high-end workstations. In time, NT will become the dominant workstation environment.

On the server side, NT will probably achieve initial success on special-purpose servers. But if Microsoft wants to get into the mainstream file, print, and directory server business, it should do itself a favor and kill off LAN Manager for NT. ◼

Ferris is president of Ferris Networks, a consultancy in San Francisco.

UPS cajoles carriers into teaming

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When UPS conceived the notion of a wireless package tracking system back in January 1991, it originally sought to enlist national wireless networks such as those from ARDIS Co. or RAM Mobile Data. But on further investigation, Heller said, the company ruled out those carriers because they lacked the geographic reach or financial stability available in the cellular industry.

> "The level of cooperation among these competing carriers was impressive. We knew we couldn't foresee everything, and they were flexible enough to support us."
>
> ▲▲▲

In May 1991, UPS made the formal decision to go with cellular and issued a request for proposal on the network in late August. By the following January, the firm had convinced an alliance of four major carriers to back the project, and last May, a contract was issued. The company then set about getting more carriers on board because, according to Heller, a nationwide cellular service needs cooperation from carriers representing the 722 cellular service areas across the country.

What convinced the carriers to participate, Heller said, was the idea of making a high-profile data application run over cellular successfully. After some testing, and the addition of 51 more carriers, the project got under way, just 15 months after the RFP was issued.

Remuneration follows cooperation

"The level of cooperation among these competing carriers was impressive," Heller said. "We knew we couldn't foresee everything and have it all written down in a formalized contract, and they were able to be flexible enough to support us."

But it wasn't entirely altruistic on the carriers' part, either. "Although we are getting a very attractive price [on the cellular usage and service charges], they are making money on the deal," Heller said. "And they are also looking on the development cost associated with the project as an opportunity to learn what they need to do in order to support data customers."

This learning process is important, because eventually, the industry hopes to hammer out its own specifications for supporting data over the cellular network. A consortium of cellular carriers, including McCaw Cellular Communications, Inc., GTE Mobile Services, Inc. and representatives of the seven regional Bell holding companies, is currently refining a specification called the Cellular Digital Packet Data (CDPD). And although that specification is expected to be finalized soon, it wasn't soon enough for UPS.

"[CDPD] is an attractive option and something we're interested in for the future," Heller said. "But we needed something in the beginning of '93, so we worked out our own agreements with the plan of moving to CDPD when that becomes available."

As for the possibility of other companies taking advantage of the carrier alliance UPS has established, a spokeswoman for the company acknowledged that was possible, but added, "Our closest competitor, Federal Express [Co.], already has its own wireless network in place." ◼

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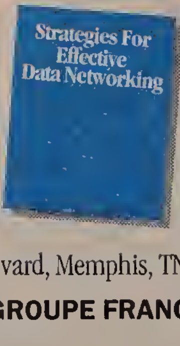

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E-mail industry to set mgmt. standards

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ies and industry forums.

The documents will be based largely on work already done by the Consultative Committee on International Telephony and Telegraphy, Internet Engineering Task Force and other standards-setting bodies in documents for X.400, the Simple Network Management Protocol and other standards.

The IFIP EMGT Group is really doing "prestandards work," said Ray Freiwirth, director of development for RCI, Inc., a consulting firm in Lowell, Mass., specializing in E-mail integration.

"We're putting everything out on the Internet to get as much input from the E-mail and communications community as possible," he said. "We don't want anyone coming up to us after a standard is set to say they didn't have a chance to contribute."

Freiwirth is a coauthor of the user requirements document, which will consist of message tracking, a configuration database and reconfiguring or disabling of E-mail network components, among other user needs.

"There is no question about the need for E-mail management standards," he said. "Tying together and managing disparate E-mail networks is always a nightmare."

The modeling document will examine how an E-mail management system would work, said Einar Stefferud, president of Network Management Associates, Inc., a Huntington Beach, Calif., consulting firm. For example, the IFIP working group will need to look at whether management information should be carried via something like the SNMP or via a mail protocol itself, such as X.400, he said.

The objects document will consist of objects to be managed by multivendor E-mail management systems. Objects will represent the various components of an E-mail network and will include contributions from the Open Systems Interconnection, Internet and personal computer-based local-area network E-mail communities.

Vendors seem eager to support the emerging E-mail standards.

"Vendors can only do a certain level of management until they get cooperation from other E-mail system vendors," said Steve Farowich, director of service delivery for Digital Equipment Corp.'s messaging practice in Bellevue, Wash. "Once standards are in place, it should make life easier for vendors and users."

To get on the EMGT Group's Internet mailing list, send your request to ifip—emailmgt—request@ics.uci.edu.

Group devises certification system

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proof equipment for issuing the public-key certificate software.

RSA is currently beta-testing such high-assurance equipment, dubbed the RSA Certificate Issuance System. The equipment lets managers issue public-key certificates to users in their organizations. It also keeps track of the certificates, providing warnings when they approach their expiration date.

A security feature of the equipment requires that three people within an organization activate the device through use of a private key broken into three parts, a concept known as secret sharing.

In addition, because small companies may be unable to afford the $14,000 price tag for the certification equipment, RSA intends to work out a time-sharing arrangement for the Certificate Issuance System if its proposal wins IPRA approval.

Mark Feldman, a computer scientist at Trusted Information Systems, Inc., whose company contributed to the development of PEM, said the most secure method for issuing a public-key certificate would be a hardware-based system such as the one proposed by RSA. He said implementing a high-assurance policy using software would be possible but extremely difficult.

A variety of low-assurance policies are likely to be approved, as well. RSA's low-assurance policy would require an end user to simply dial into a server for remote registration. No verification of the user's identity would be required.

Bert Kaliski, RSA chief scientist, pointed out that the IETF certification system is designed to "let anybody get into the game" who can present a system they can implement that meets with IPRA approval.

He noted that reaching an agreement on the PEM certification system was much more time-consuming and difficult than approving the technical parameters of the standard.

User participation in the PEM certification system is voluntary, but to encourage users to employ the procedures, the IETF will not charge a registration fee during the first two years.

or Outdated?

Industry Briefs

continued from page 23

record revenue of $283.6 million for 1992, up 53% from the previous year. Informix's earnings more than quadrupled to $54.7 from 1991. For the fourth quarter ending Dec. 31, Informix reported $79.2 million in revenue, up about 47% from the same period in 1991. Earnings rose 60% to $13.3 million for the fourth quarter compared to the same period last year.

Retix has record year. Retix, a Santa Monica, Calif., vendor of open systems software and internetworking products, reported revenue of $70.8 million for 1992, up 17% from 1991. Earnings for 1992 doubled to $8 million from the previous year. For the fourth quarter, Retix recorded revenue of $19.1 million, up 18% from 1991's fourth quarter. Earnings for the quarter were $2.5 million, up 71% from last year's fourth quarter.

Systems Center's revenue up. Network management software vendor Systems Center, Inc. reported revenue of $131 million for 1992, up 7% from 1991. Earnings were $5.8 million, up 66% from the previous year. Fourth-quarter revenue was $37.2 million, up 6.6% from the same quarter in 1991. Fourth-quarter earnings more than quintupled to $3.3 million from the 1991 fourth quarter.

Ups and downs for Telebit. Telebit Corp., a Sunnyvale, Calif., vendor of local-area network access products, reported revenue of $54.1 million for fiscal 1992, up 22% from the previous year. It registered a net loss of $1.3 million in comparison with a net loss of $8.7 million the year before. Telebit listed its fourth-quarter revenue at $13 million, down from $13.3 million for the period last year.

VMX to buy Rhetorex. VMX, Inc., a San Jose, Calif., voice processing equipment maker, has agreed to buy Rhetorex, Inc., a Campbell, Calif., vendor of personal computer-based voice processing systems, for about $7 million. The sale, set for completion by April, will involve the exchange of 1.75 million shares of VMX common stock for all issued and outstanding Rhetorex stock.

The Rhetorex purchase will round out VMX's overall product portfolio with a system serving less than 100 users. Rhetorex will operate as an independent, wholly owned VMX subsidiary.

Cheyenne buys imaging firm. Roslyn, N.Y.-based Cheyenne Software, Inc., a supplier of local-area network backup and monitoring software, announced it has bought Applied Programming Technologies, Inc. (APT), a Lake Success, N.Y., company specializing in imaging storage software. Cheyenne purchased APT's assets for 95,238 shares of unregistered Cheyenne common stock and the assumption of certain APT debts, making the deal worth about $2.7 million.

Cheyenne said an integration of its ARCserve data storage management product with APT's imaging storage technology is planned.

Xpedite buys TRT's fax assets. Xpedite Systems, Inc., an Eatontown, N.J., facsimile service firm, has acquired certain assets and customer accounts from TRT Communications, Inc., a Washington, D.C.-based carrier. The systems and accounts bought fall into the area of text-to-fax services, as well as computer-originated fax and related messaging services. Terms of the deal were not disclosed.

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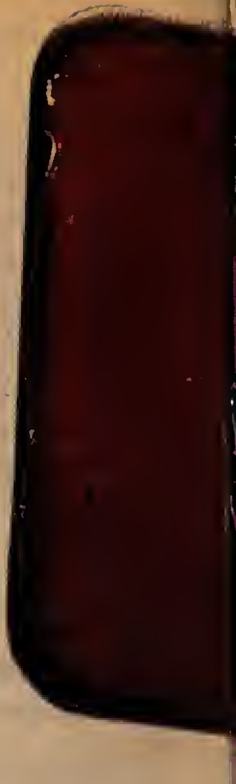

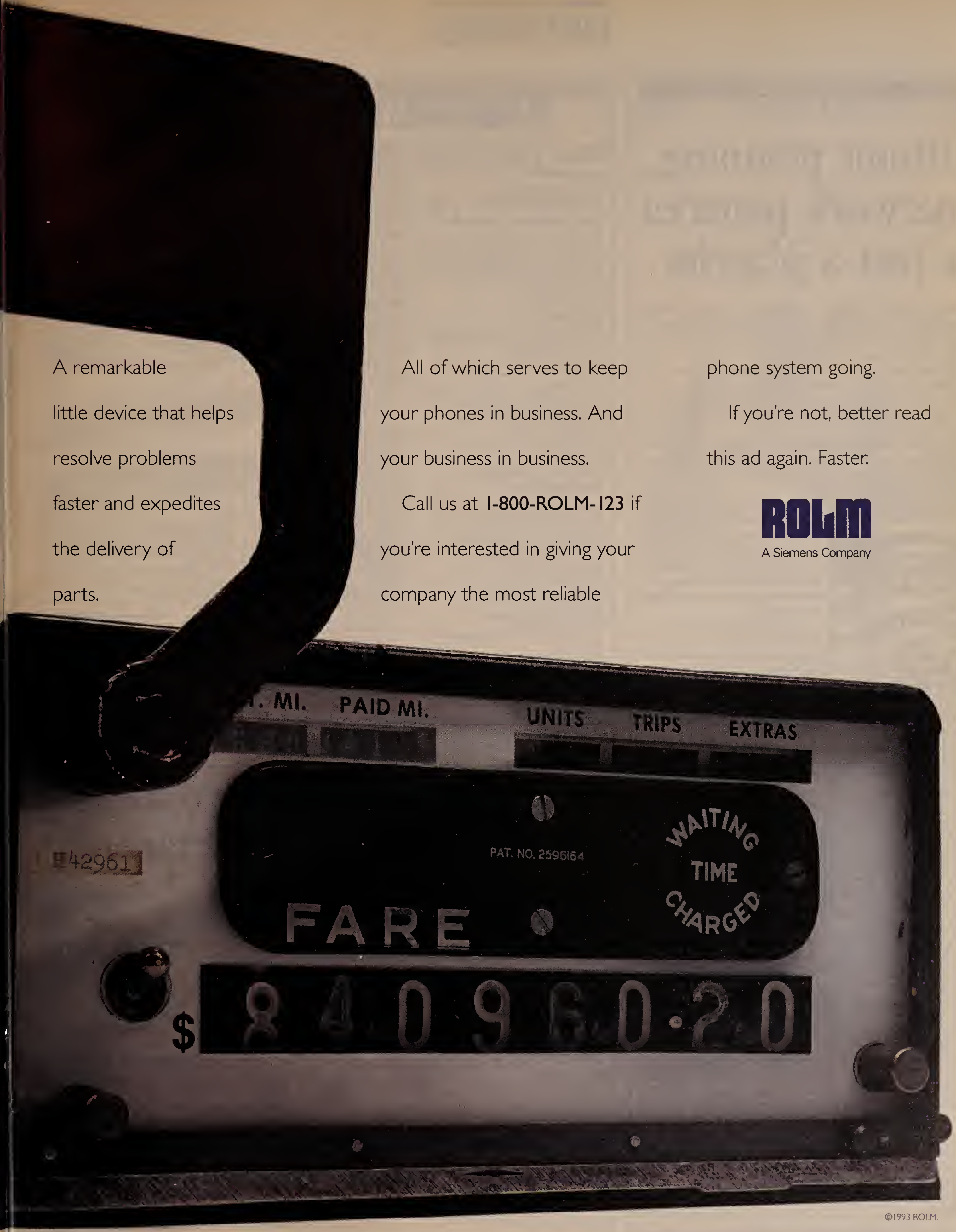

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OPINIONS

OUTSOURCING

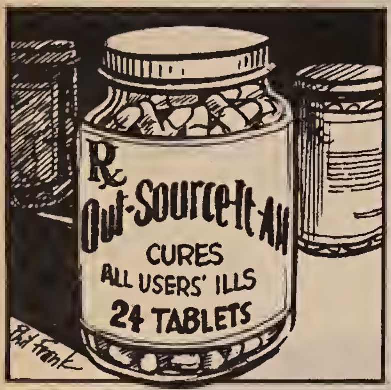
BY KATHRYN KOROSTOFF

Without planning, a network panacea is just a placebo

Network outsourcing is often portrayed as a panacea for the headaches created by running a large network. But for many companies, network outsourcing is merely a placebo — it may taste good, but it doesn't cure anything.

By learning from the problems other companies have experienced, you can save yourself a lot of aggravation — and money — by being better prepared to negotiate network outsourcing contracts or by revisiting the outsourcing decision altogether.

Many organizations see network outsourcing as a way to cut costs by reducing staff and equipment expenses. Unfortunately, some early user experiences indicate that cost-cutting objectives are not always met.



For example, very often the organization plans to drastically reduce staff as soon as the outsourcer takes over the network. But often the transition period is much longer and more difficult than expected. As a result, the organization may have to retain employees to assist with the transition.

A similar situation occurs when an organization ends up using two or more outsourcers instead of one. This happens when a company finds that no single outsourcer can meet all of its network outsourcing requirements. The result is that staff must be retained to coordinate the outsourcers.

Another factor that can make the outsourcing experience more difficult than anticipated occurs when the organization's outsourcing requirements change. Business changes, carrier pricing trends or other external events may affect what part of the network is cost-justifiable to outsource or whether to outsource at all.

Most outsourcing service providers push for five- or 10-year contracts that usually commit the organization to a fixed minimum of at least $500,000 per year — and often $1 million or more. When these contracts are significantly altered or broken, the organization incurs penalties.

One way to avoid such penalties is to take a more modular approach to outsourcing.

For example, an organization may use the outsourcer to manage mature services while the internal staff focuses on developing new applications. Or an organization may tap an outsourcer for expertise it lacks — such as a vertical market application or international expansion. By defining the outsourcers' work requirements more specifically — and more short-term — some problems can be avoided.

Network outsourcing can save a company money and help bring in needed expertise. But be aware of the possible outsourcing pitfalls and have contingency plans before you sign a contract. One potential solution is to test your outsourcer's flexibility by negotiating for shorter contract periods or using a modular approach. Through careful planning, network outsourcing can be a true panacea.

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EDITORIAL

Lack of strategic planning a high cost to net managers

"Sometimes, I think, the
things we see
Are shadows of the things
to be;
That what we plan, we build."

In that passage from *Dreams and Realities,* poet Phoebe Cary distilled the essence of innovation and success: What we plan, we build.

Whether in our personal or professional lives, planning — and the discipline to work the plan — can mean the difference between success and failure, recognition and obscurity.

Yet, as this week's Reader Advocacy Force article spotlights, far too many network executives fail to develop long-range technology plans and procurement policies designed to achieve strategic goals, such as supporting new applications, cutting costs or providing interoperability among diverse systems.

NETWORK WORLD'S
R.A.F.
READER ADVOCACY FORCE

It's easy to understand why. Information systems (IS) departments are being asked to do more with limited resources. Managers struggle to deal with the here and now and keep current with technology. Time and personnel pressures make putting off planning seem like a rational course.

Yet the cost is staggering.

Without a strategic plan, your company makes uncoordinated purchases of incompatible technologies and throws money at automating processes that should have been scrapped or reengineered. When hoped-for productivity gains aren't achieved, top executives shake their heads and question the value of technology.

Worse, if your rival has a strategic plan, your company may soon find itself at a marketplace disadvantage. Combined, those problems make outsourcing IS — including your job — attractive to upper management.

Strategic planning is hard work, but it's the cost of moving to open systems and aligning business and technology goals. The old adage is more true than ever before: Nobody plans to fail, they simply fail to plan.

DISTRIBUTED COMPUTING

BY JOHN R. RYMER

Token ring lags behind Ethernet on road to ATM

Users planning their next-generation local-area networks are increasingly looking to Asynchronous Transfer Mode (ATM) technology to fulfill their bandwidth needs. In the meantime, their goal is to make the migration to ATM as painless as possible. From this standpoint, many users are finding that Ethernet provides a much smoother migration path than does token ring.

The two key needs driving future LAN requirements are available bandwidth and network responsiveness. As the size of the objects used within applications and the number of applications using networks grow, more bandwidth will be required to support users. Currently, both Ethernet and token-ring installations are capped at less than 20M bit/sec of bandwidth.

Network responsiveness is determined by the available bandwidth and the number of concurrent users of that bandwidth. Both Ethernet and token ring manage access to shared media by network devices. Ethernet manages competing claims on the available bandwidth using a collision detection algorithm; token ring uses a bandwidth allocation algorithm.

In both Ethernet and token-ring LANs, heavy usage will slow response time. In both topologies, there are two ways to respond. The first option is to migrate to a higher bandwidth solution. The leading candidate, by default, is Fiber Distributed Data Interface, a 100M bit/sec, shared-media topology using fiber-optic cabling. But moving to FDDI is expensive: It requires new adapter cards, new cabling and new network equipment such as hubs.

The second option is to reduce the number of LAN users employing a technique called segmenting. A busy server, for example, might be put on its own segment or ring. This gives the server exclusive use of all available bandwidth supported by the segment. Bridges, routers or switches are then used to link segments or rings.

While the token-ring world is just beginning to embrace segmenting, Ethernet sites have used the technique for a long time. The Ethernet experience tells us that switches are the best way to interconnect segments — not routers or bridges. In a LAN that employs switches, nodes don't vie for a single pool of available bandwidth. Rather, requests are forwarded to a matrix switch that can guarantee the user dedicated access to one of two or more dedicated channels. Each channel utilizes all available bandwidth on the LAN. The result is dedicated bandwidth on demand, which virtually ensures good response time, even under heavy loads.

> Many users are finding that Ethernet provides a smoother migration path.
>
> ▲▲▲

Switching is also at the heart of 100BaseVG, a proposed standard by Hewlett-Packard Co. and AT&T for 100M bit/sec Ethernet over unshielded twisted-pair wiring. 100BaseVG is an extension of the 10Base-T Ethernet standard. ATM, the proposed ultimate solution, also relies on switching rather than shared media to support dedicated bandwidth on demand.

Neither IBM nor Proteon, Inc. — the major drivers of token-ring technology — plan to introduce switching to token ring in the near future. Instead, they recommend that token-ring users seeking higher bandwidth employ segmentation. For very high bandwidth applications, both IBM and Proteon recommend installing FDDI as a backbone linking multiple rings, and eventually migrating LAN traffic to FDDI rings. In the long run, IBM and Proteon expect users to require ATM backbones and ATM to the desktop to meet their bandwidth needs.

This all means that as users plan networks to meet demands for years to come, Ethernet has a smoother migration path to dedicated, high-bandwidth networks than token ring. With Ethernet, the steps are first to switched 10BaseT, then to 100BaseVG and then to ATM. These transitions are accomplished without changing wiring, although new adapter cards and network hardware are required.

With token ring, the migration is from 16M bit/sec LANs to FDDI and then to ATM. This transition doesn't give users the option to use switching to support segmentation, and it forces a wiring change to get to FDDI. For this reason, Ethernet seems to offer users a better future than token ring. ◻

Rymer is vice president of the Patricia Seybold Group, Inc. and editor in chief of the "Distributed Computing Monitor," a monthly research report. He is also program chair of the annual Patricia Seybold Marathon Week conference, scheduled for April 19-23 in Boston.

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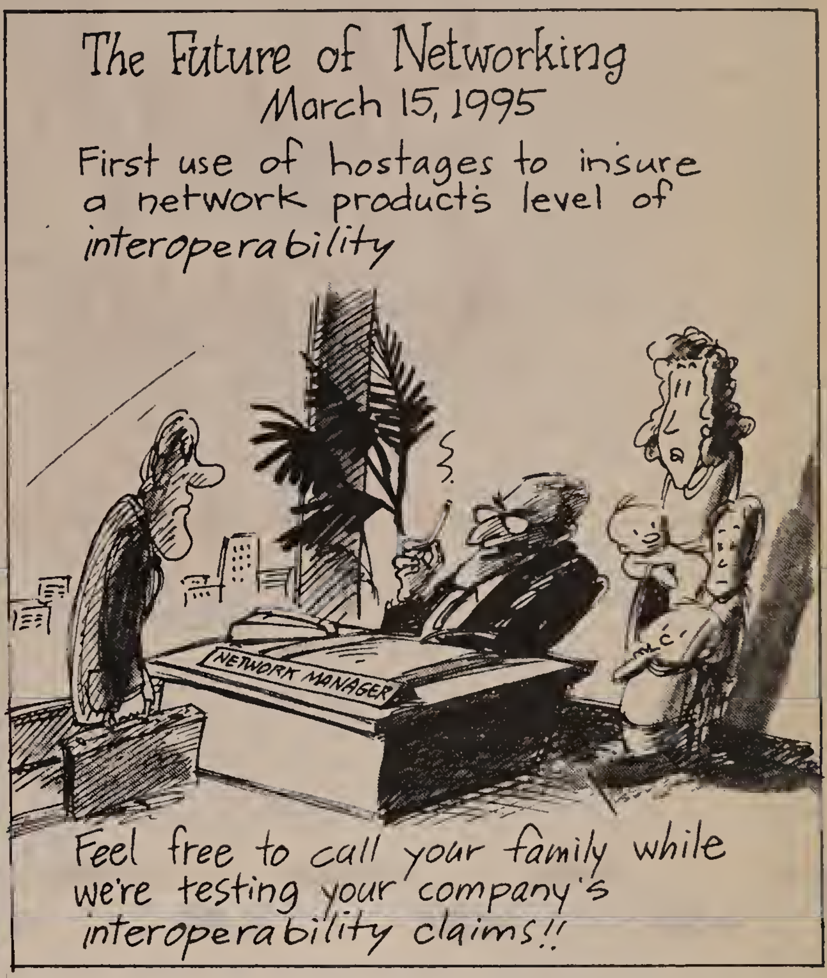
BY FRANK AND TROISE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A fresh outlook on

Hearing the word "outsourcing" still causes many network managers to wince in fear that their entire operation, including equipment, staff and network facilities, will be turned over to a third party, leaving them without a job. But a growing number of net managers are realizing that the use of outsourcing vendors to support functions once considered the province of private network staff has its benefits.

Forced by upper management to cost-justify operational costs, network managers are becoming more sophisticated in the way they think about using outsourcers. Users are realizing they no longer have to turn over the entire operation to an outsourcer.

Instead, they are taking a modular approach by slicing up the network operations pie into individual tasks and handing off those pieces that can be performed more economically and efficiently by an outsider.

By off-loading complicated or nonmoneymaking parts of the operation, these network managers can focus their time and energy on more important functions such as network planning, devising strategic business applications or applying network technology to reengineer work processes.

Users today are considering turning over parts of their operations to a long-distance carrier, systems integrator or a computer vendor.

For instance, a company might outsource data center operations and application support modules to a systems integrator, wide-area network modules such as the operation and management of modems, multiplexers and private branch exchanges to a carrier, and local-area network and client/server application installation and operation to a computer vendor.

A few years ago, most outsourcing deals involved a turnkey transfer of capital equipment, operations staff and network facilities to a vendor such as Electronic Data Systems Corp. (EDS) of Plano, Texas, or Computer Sciences Corp. (CSC), located in El Segundo, Calif.

Users often find that carriers are able to do a better job of networking and network management than they could, while systems integrators can do a better job at data processing.

For instance, Continental Bank Corp., which is based in Chicago, has a considerably faster network technology turnaround time as a result of an outsourcing agreement with WilTel, according to Bill Murschel, manager of media relations at the bank.

In addition, Continental employees have washed their hands completely of technology questions and are concentrating on banking, he adds.

Continental transferred about 30 employees to WilTel under a network outsourcing agreement and about 450 employees to IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary under a separate data processing outsourcing deal.

Users are also tapping computer vendors for modular outsourcing deals.

Digital Equipment Corp., for instance, manages just a piece of Cambridge, Mass.-based Lotus Development Corp.'s 5,000-node network. Lotus does its own logical and physical network design and uses DEC to keep the network running.

"[DEC does] trouble shooting, problem determination and network hardware," says Gene Cort, vice president of information systems (IS) and support for Lotus. "We keep the portion we think we can add value to, and we outsource where we think there are efficiencies because of economies of scale. We're freeing up our resources for [network] planning for the future rather than for day-to-day [network] firefights."

The new kids

While all three types of outsources offer modular deals, long-haul carriers are fast becoming a force in the market. They have gained a better understanding of the complexity of distributed computing strategy and its corresponding broad geographic reach. Likewise, carriers can support user requirements for near-100% reliability of networks that run mission-critical applications and provide robust network services. Being national or international in scale, carriers are, in some cases, better positioned to provide local site support to a wide array of geographically dispersed sites.

In network outsourcing arrangements that involve substantial use of wide-area circuits, the carriers almost always offer a strong cost advantage over computer vendors and systems integrators. For the leading domestic and international network service providers, outsourcing has become a top priority and a means of locking in long-term circuit revenue as well as service and support contracts.

The outsourcing arms of MCI Communications Corp. in Rye Brook, N.Y., AT&T in Bridgewater, N.J., and WilTel in Tulsa, Okla., as well as international efforts by Infonet Services Corp. in El Segundo and BT's Syncordia of Atlanta, are fast becoming independently recognized business units of their parent companies. These units leverage their parents' WAN resources and are developing their own expertise in data networking, LANs, private network management, and even software and systems support.

MCI's outsourcing offerings, which it calls management services, range from full-service arrangements to specialized deals. The scope of services that MCI supports goes beyond the traditional carrier transport services to include LAN and desktop integration, as well as LAN and WAN design, installation and management. Most of its outsourcing deals resulted from existing customer relationships.

MCI's services include helping a client's financial staff with the allocation and chargeback of communications costs and building internal chargeback tariffs. MCI is active with global outsourcing through a number of channels. Its Global Communications Service coordinates network services across more

ILLUSTRATION ©1993 WILL TERRY

outsourcing

By KIMBERLY PATCH and
MARY JOHNSTON TURNER

Users find farming out pieces of the network operations pie has its benefits.

than a dozen countries. MCI is also a 25% owner of Infonet and is the U.S. sales channel for Infonet's Enterprise-Defined Network Service, which provides international turnkey design, installation, operations and management of public and private hybrid nets.

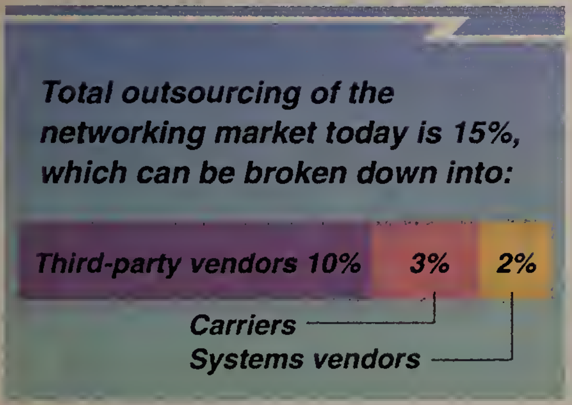
MCI is willing to acquire staff and capital equipment from a customer.

AT&T, especially after its acquisitions of computer vendor NCR Corp. and European systems integrator AT&T Istel, is becoming an increasingly powerful player in the outsourcing business. AT&T's Accumaster Management Services feature a broad array of network management technology.

The carrier has competencies in network operations and support, as well as the provision and management of circuits. AT&T is willing to assume ownership of equipment and staff, although the carrier prefers to use its own people to augment the user's staff.

Given its ownership of NCR, AT&T is now finding itself in the midst of many complex outsourcing deals, which include LAN and desktop computing issues, as well as WAN design and operations. In Europe, AT&T relies on AT&T Istel to provide manpower and network management services from AT&T's Global Network Services Centers in the U.K. and the Netherlands.

AT&T Istel has experience in computer-integrated manufacturing, simulation software, decision support systems and project management. Also, the firm has a large private data network and offers a wide range of value-added data services. It provides network services to the European travel industry and will also manage equipment from a number of vendors, including IBM and DEC.



WilTel's offerings run the gamut from WAN operations to administration and ongoing management of LANs and customer premises equipment, but its emphasis is primarily domestic.

WilTel prefers to assume ownership of a client's staff and equipment in order to simplify its environment, says Anthony Moreno, WilTel's director of management services. "We prefer to take ownership of the CPE and the staff, although we will work with the customer on whatever scope of service they desire," he says.

Like most carriers, WilTel finds itself on different sides of teaming arrangements, depending on the project.

As a part of its network management services, WilTel will offer to build and support dedicated private management centers, but more often, it extends and partitions its existing operations support system to meet a customer's needs. For example, WilTel often partitions its trouble-reporting system for each customer. This enables a user to tap into the system and view only those reports that detail trouble with the circuits used by the customer. The same applies for order entry, service dispatch and the full range of WilTel's administrative and configuration management support systems.

On the international front, Infonet touts its strong relationship with carriers in many countries when pitching its outsourcing services. In fact, 10 carriers — foreign post, telegraph and telephone administrations among them — own a stake in Infonet, making it somewhat easier for the company to do business overseas. Infonet also has technical staff in 46 countries. This enables the firm to quickly establish global links.

In one case, Infonet built and started operations of a multinational network for a pharmaceutical company in three months. The pharmaceutical firm estimated that it would have taken two years to build the network on its own.

Infonet is also branching out into other services. Its InfoLAN offering supplies users with LAN/WAN connectivity and router services. In the InfoLAN offering, Infonet owns and operates the connected routers, provides long-haul circuits and local-loop circuits. The service includes monthly, daily and weekly management reports that show network service levels such as availability and error rates.

Last month, Infonet announced an agreement with Microsoft Corp. to move into remote desktop management, as well ("Infonet joins Microsoft in LAN mgmt.," *NW*, Jan. 25).

Finally, in what may be the most visible commitment to network outsourcing as a separate field of business, BT

(continued on page 36)

Freeing up sticky problems

Global networking poses two sticky problems for users. Because they are highly distributed by nature, these networks are expensive to install and maintain. Additionally, users face the difficult task of dealing with multiple carriers, typically one for every country through which the network runs.

Although Europe presents a maze of different carriers — each of which often has its own special rules and regulations — users can run into more difficult problems in establishing and maintaining connections to Third World locations, such as in Africa and South America.

So rather than dealing with these issues on their own, some users have opted to turn over their international networks to outsourcers, most notably carriers that have strengths in acquiring and managing international circuits.

J.P. Morgan & Company, Inc., for instance, signed a three-year, $8 million contract for AT&T's global Accumaster Management Services earlier this year. AT&T will manage a high-speed wide-area network connecting J.P. Morgan's local-area networks throughout Europe, North America, Asia and Australia.

San Bruno, Calif.-based Trans Ocean, Ltd., a company that transports liquids worldwide, awarded an outsourcing contract to Infonet Services Corp. to build a network that reaches its 15 locations spread across several continents. One of the main reasons Trans Ocean chose Infonet is because the company has contacts and partners worldwide, including in difficult-to-reach countries.

"If you're outsourcing internationally, unless you're experienced at it, you will need help navigating the maze of international PTT monopoly rules and regulations," says Brian Anderson, director of information systems at Trans Ocean.

He adds that the right contacts are needed even in technically advanced countries such as Germany.

"It's not the same as the laissez-faire data communications world we have in the U.S.," Andersons says.

In addition to complex rules and regulations, the equipment in foreign countries can be difficult to work with. In South America, Anderson says, "if you don't have a lot of time, money and energy, you will fail. It is very difficult."

Infonet officials are betting that their global approach, which includes technicians at permanent locations in 46 countries, will help the firm capture a lot of business as nets become more global in reach.

"In the future, technology is not going to be the differentiator," says Randy Lintecom, executive vice president for corporate marketing at Infonet. "What will make a difference is our ability to deploy solutions quickly, have expertise on the ground and have a global infrastructure that supports rapid deployment."

In the end, users can find that working their way around problems posed by various carriers is a big job, one that can often be done with less trouble by outsourcing to an experienced carrier.

— *Kim Patch*

(continued from page 35)

created Syncordia. Syncordia is in the process of constructing a global 70-city net to support rapid deployment and reliable global network services. The company also leases circuits from other carriers to fulfill customer requirements.

Syncordia recognizes the importance of merging networks and computers, with the company stating it is willing to take responsibility for a broad range of global functions, including desktop computing and applications, network applications such as electronic mail, and devices such as routers, PBXs, modems and muxes, as well as LANs and international circuits.

Syncordia also offers network planning, design, end-user help desk support, circuit procurement and related administrative services. The company is willing to take on its customers' capital and leased assets, staff and administration of existing vendor contracts involving end-to-end network services.

Like most outsourcers, Syncordia backs up its service claims with a detailed Service Level Agreement (SLA). The SLA specifies targets for network availability, error rates, outages, response time to problems, billing accuracy and end-user service support levels. If Syncordia fails to meet its SLA requirements, the customer receives substantial credits.

Outsourcing vendors
Figure 1

Third-party vendors: Tend to specialize in turnkey solutions
- Computer Sciences Corp.
- Electronic Data Systems Corp.
- Syncordia Corp.

Systems vendors: Tend to specialize in building networks
- IBM
- Digital Equipment Corp.

Companies formed by partnerships:
- Advantis: IBM and Sears, Roebuck and Co.
- Infonet Services Corp.: 10 carriers

Carriers: Tend to specialize in WAN services
- AT&T
- MCI Communications Corp.
- Sprint Corp.
- WilTel

Although each type of vendor approaches outsourcing from a different angle, most are expanding their offerings to include an increasingly wider range of services.

GRAPHIC BY TERRI MITCHELL

SOURCE: KIMBERLY PATCH, JAMAICA PLAIN, MASS.

The rest of the market

With all the activity on the part of carriers and their outsourcing arms, the traditional systems integrators and computer vendors have not been sitting still. In fact, IBM is making a stronger presence in modular outsourcing. With ISSC already providing a strong data center outsourcing presence, IBM recently targeted the unique business of network outsourcing by merging its IBM Information Network with Sears, Roebuck and Co.'s Sears Technology, Inc. and Sears Communications Co. worldwide networks to form Advantis of Schaumburg, Ill.

Advantis builds on IBM's strengths in Systems Network Architecture and Sears' background in retail systems and financial transaction processing. The firm is concentrating on expanding its expertise to include Transmission Control Protocol/Internet Protocol environments and is expected to announce some new LAN-to-LAN capabilities in the near future.

Advantis deals range from well under $1 million per year to more than $40 million per year. Like systems integrators, it is willing to acquire a client's staff and capital assets.

One of the main reasons Mitsubishi Electronics America, Inc. struck a network outsourcing deal with Advantis was because "it minimizes the capital investment we have to make," says Danny Rhyan, Mitsubishi's telecommunications manager. "It reduces the obsolescent risk of our own equipment."

Traditional systems integrator EDS is rumored to be negotiating with BT to join EDS' data processor expertise with BT's networking skills. Currently, EDS provides some network services by reselling capacity on its EDSNet. However, most EDSNet facilities are leased from one of the carriers.

CSC, like EDS, specializes in soup-to-nuts turnkey deals where the company takes ownership of all network equipment and staff, and performs network design, installation and operation functions. The typical CSC deal involves from 10% to 35% network services, although some deals have been almost exclusively network-oriented. CSC sees carriers as partners rather than direct competitors and will generally team with a carrier in a joint bid.

CSC has recently acquired a number of professional services organizations that will allow it to add more value to a wider range of customers. These acquisitions include North Carolina-based CSC Compusource, which markets its services to users with monthly budgets as low as $50,000.

Through CSC Partners, a software development house, and CSC Index Systems, a management consulting company, CSC supports software development and work process reengineering and optimization.

Clearly, in addition to the flexible modular deals being pursued by many users, there remains room for one-stop turnkey arrangements. General Dynamics Corp. has seen significant benefits from its 10-year, $1 billion-plus outsourcing agreement with CSC.

"We've got $200 million in the bank, and we reduced the assets in our balance sheet so that our return on assets has gone up," says Ace Hall, corporate

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vice president of IS for General Dynamics. "We've eliminated about 2,500 people, and we've reduced operating costs."

The turnkey agreement even makes it easier to divest other divisions of the company without disrupting its IS, Hall says.

DEC is also continuing to beef up its network outsourcing resources. Best known for winning the voice and non-SNA data network portion of the Eastman Kodak Co. outsourcing deal, DEC's outsourcing business is leveraged by growth in client/server computing.

DEC often teams with carriers, systems integrators — such as Andersen Consulting and Cap Gemini Sogeti — and even rival IBM to provide a complete outsourcing solution. DEC works with more than 1,300 hardware and software vendors through its equipment service and support arm.

The company uses senior staff from its internal telecommunications and technology operations to help win outsourcing deals. As a result, a manufacturing company seeking to install and operate LANs in a factory might find its project team led by someone who lived through the same experience at a DEC facility.

Likewise, DEC makes many of its internal administrative systems, such as the help desk and dispatch system that run its internal field service operation, available to outsourcing clients. Despite internal reorganizations, outsourcing and professional services remain a priority at DEC. Perhaps this is because DEC's outsourcing and professional services grew by 22% last year.

Adding value

Carriers, systems integrators and computer vendors have found that the way to success is offering services packaged exactly in the format desired by the customer, whether that be complete turnkey, modular or some kind of shared responsibility. Modular service options often fit better into corporate cultures that view control over communications as a strategic issue.

However, as users become more sophisticated, their demands on vendors escalate. No longer is the installation and operation of a near-100% available network enough. Users are looking for outsourcers to provide higher service levels, more expertise in distributed networks, remote office support in the U.S. and overseas, and state-of-the-art security, billing and network management.

"The average user doesn't want to manage a net — he wants to sue somebody if it doesn't work," says Thomas Nolle, president of CIMI Corp., a market research company in Voorhees, N.J. "If I'm Reebok [International, Ltd.], I don't want my best [people] doing networks, I want them doing sneakers."

Top reasons to outsource

Figure 2

1. Shift networking costs from a capital expense to a more consistent service cost
2. Allow personnel to concentrate on core businesses
3. Off-load an increasingly complicated division of a company, sometimes without having to reduce staff
4. Gain better networks without having to keep up with networking technology internally
5. Hedge all bets on emerging technologies
6. Cut down on extra expenses, such as extensive travel and maintaining off-site networking personnel, that are associated with distributed networks
7. In some cases, cut down on networking costs due to economy of scale

GRAPHIC BY SUSAN SLATER

SOURCE: KIMBERLY PATCH, JAMAICA PLAIN, MASS.

Outsourcers agree. "More and more customers are calling about services rather than premises-based solutions as they become more comfortable in considering outsourcing as a way of freeing their staff to focus on business process and technology problems," says Bill Gilbert, AT&T's director of network management.

In addition, more users want outsourcers to handle somewhat routine tasks such as installing and maintaining LANs in far-flung locations. Hiring an outsourcer to perform this task often turns out to be cheaper than putting an employee on a plane every time a new LAN is needed or an existing LAN develops problems.

As organizations expand into more countries, it becomes increasingly difficult to establish global networks without some kind of outside help (see "Freeing up sticky problems," page 33).

Analysts predict that outsourcing will grow over the next five years. All three types of vendors are poised to increase their network outsourcing businesses. At the same time, the definition of what is included in network outsourcing will continue to expand and challenge the vendors' resources. If many users this year draw the boundary of the data network at the router or hub, the boundary in 1995 may extend to the desktop workstation.

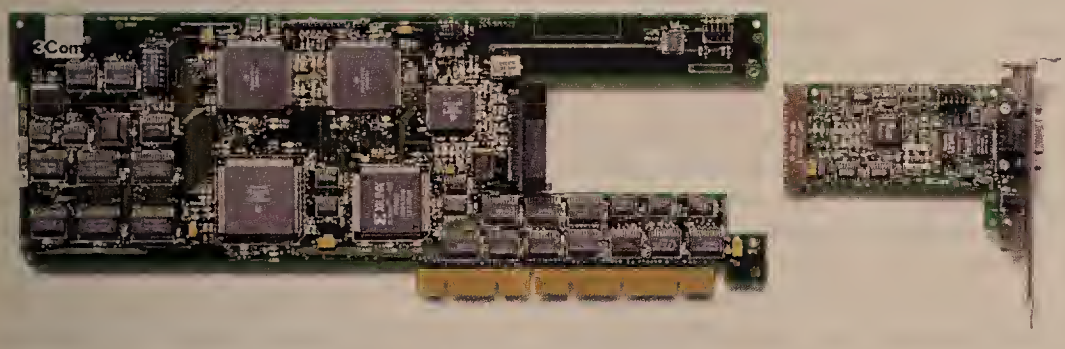
Communications across the enterprise and the ability to coordinate it quickly and cost-effectively will become important as the use of alliances and subcontractors grows globally.

To succeed, each type of outsourcer will have to expand its individual credentials. Systems integrators will need to become increasingly flexible and global, and continue striking deals with carriers for cost-effective network facilities.

Computer vendors offering

(continued on page 41)

tch that lit the fuse that
DI revolution.



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Networks That Go the Distance™

Tests of 6611 validate IBM claims, raise concerns

continued from page 1

and others to be routed on the same physical backbone network. Like most other multiprotocol routers, the 6611 does not behave as a single router supporting multiple protocols. Instead, it is more like multiple virtual routers — each supporting a separate protocol, creating its own network overhead and setting its own line-sharing priorities.

However, some routers add value by allowing users to assign higher priorities to some protocols that share a line. This would make it possible for network managers to customize their networks for delay-sensitive applications or protocols. For instance, some SNA 3270 emulators with timer defaults for local LANs may need to be given a higher network priority to prevent session loss.

The 6611 has a fixed bias to SNA traffic and extends equal line sharing among other protocols. For SNA emulators with short timers, this preference is clearly a benefit. However, the bias could be a problem for non-SNA applications developed with timers set for a local-area network environment and then used in a heavily loaded network.

On another front, one of the most expensive problems in large token-ring source route bridging (SRB) networks has to do with broadcasts. Broadcasts become expensive because they congest wide-area network links, increasing the need for higher speed lines. For The Travelers, that could cost $750,000 annually.

Broadcasts are used by many network operating systems, protocols and applications for many purposes, including route discovery, network entry, server logon, message multicasting and connectionless datagram message sending. Datagram broadcasts represent a serious problem because they are typically larger and consume more line capacity than other types of broadcasts.

Some routers limit broadcasts by using statically-defined filters. This approach works well in networks with defined traffic patterns such as hierarchical networks. Because all traffic goes to the same destination in a hierarchical network, the same filter can be used in all locations. However, in true peer nets where there are many sources to destinations, filter administration is more difficult to administer.

Alternatively, the 6611 provides a learning filter where sources and destinations are dynamically learned and broadcasts are blocked from unintended destinations. In The Travelers' testing, the 6611 Data Link Switching (DLSw) eliminated almost all the SNA broadcasts — workstation to front-end processor (FEP) — and up to 60% of the NETBIOS broadcasts — client-to-server and server-to-server — from entering nondestination subnets. It also blocked most broadcasts destined for devices in the same subnetwork. Broadcasts destined for devices in another subnet were blocked from congesting nondestination subnets.

By contrast, Release 9.1 of Cisco Systems, Inc.'s router software also uses a learning NETBIOS filter but does not block datagrams.

The 6611 is the only router intelligent enough to recognize and block duplicate broadcasts, a common occurrence relating to SNA and NETBIOS traffic. In SNA environments, for example, if a front-end controller fails, all connected devices go into recovery mode. This will eventually result in a burst of broadcasts that potentially spread the problem throughout the network.

Every OS/2 LAN Requester announces itself with 24 broadcasts (by default) when it boots, and issues another 18 broadcasts when it logs onto its domain server. Because these broadcasts do not have a specific destination, they cannot be blocked. However, the 6611 recognizes the duplicates and only passes one for the activation and one for the log on, reducing the overall demand for line capacity.

LLC termination tricks

Customers considering the 6611 for its IBM network features will be pleased. IBM's DLSw, which is IBM's routing code for transmitting SNA and NETBIOS over Transmission Control Protocol/IP links, works well in nets with moderate SNA traffic.

The 6611 provides SDLC termination instead of a FEP.

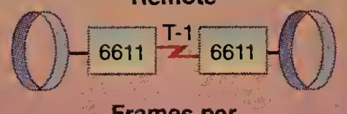
▲▲▲

Another major plus of the IBM 6611 is its DLSw 802.2 Logical Link Control 2 (LLC2) session termination. LLC2 sessions underlay most higher layer LAN protocols, including SNA and NETBIOS. LLC2 has its own overhead frames, which flow between sources and destinations such as workstations and servers. These frames are used for frame acknowledgment, failure notification and flow control. While LLC2 frames are important, they do add significant overhead.

The 6611 LLC2 termination feature allows the router to act as a local destination for the LLC2 session. While providing proxy function on behalf of the real destination, the feature blocks overhead frames from crossing the WAN, reducing its congestion.

Most SNA LLC2 sessions are set up by default to send one Receiver Ready (RR) acknowledgment for every frame sent. Most routers not only pass these frames, but also add more header overhead. SNA 3270 applications tend to use small frames.

IBM's 6611 performance

	Local Frames per second	Remote  Frames per second
Source route bridging	3,900 (IBM)	2,600 (IBM)
	3,364 (Bradner)	2,603 (Bradner)
Internet Protocol	3,900 (IBM)	3,900 (IBM)
	3,733 (Bradner)	3,123 (Bradner)
SNA/NETBIOS*	500 (IBM)	450 (The Travelers)

Figures are based on testing by Harvard University, IBM and The Travelers.

* As routed over TCP/IP

GRAPHIC BY SUSAN SLATER

SOURCE: THE TRAVELERS CORP., HARTFORD, CONN.

In a local network where the average information frame size is 400 bytes, RRs would account for less than 0.5% of network traffic. Over router networks using TCP/IP encapsulation, RRs account for 13% of the traffic sent.

By contrast, in The Travelers' tests, the 6611 blocked all RRs from hopping onto the WAN. It uses TCP's windowed acknowledgments for guaranteed delivery. With windowed acknowledgments, as the error-free octets are received, the frequency of the acknowledgments drop, cutting overhead significantly.

Yet another benefit to the 6611's LLC2 termination is that the router can provide congestion control by withholding RRs from the end station. Routers that do not offer LLC2 termination throw away frames when congested and rely on the originating workstation to retransmit the message.

In The Travelers' tests, the 6611 did withhold RRs to ease network traffic.

Not only does the 6611 terminate the LLC2, but it also terminates the bridge path. This removes the seven-hop limit for SRB frames, which has been an obstacle in large token-ring networks. The Travelers' tests verified that the 6611 supports six hops on either side of the router.

The direct approach

For networks that use IBM Remote Bridges, there is more good news. These remote bridges can connect directly into the 6611 over a wide-area link, as opposed to a pair of IBM bridges and an intermediate LAN to get to router.

This results in two benefits: reduced equipment costs and reduced overhead. Add-on bridge serial ports for the 6611 cost about $3,500 for two, compared to a stand-alone IBM Personal System/2 with bridge program, token-ring card and RTIC cards that cost more than $4,000.

The advantage is that The Travelers' tests showed that by directly connecting IBM Remote Bridges, the 6611 can block broadcasts not destined for a remote ring.

The 6611 also provides Synchronous Data Link Control termination instead of a FEP. By moving this polling function to a 6611 locally connected to a controller, line costs are reduced and FEP polling cycles eliminated.

Despite these savings, The Travelers chose not to test this feature because the 6611's SDLC interface supports only PU 2.0 in half-duplex mode. Full duplex is important for performance over multidrop circuits. Another concern for The Travelers was the potential impact polling may have on the 6611 CPU.

Bouncing back

Another welcome feature the 6611 provides IBM networks is route recovery without session loss for SNA and NETBIOS. The 6611 provides an option to use Open Shortest Path First (OSPF) to route all IP frames.

On the 6611, IP frames carry data not only for TCP, but also for SNA and NETBIOS. OSPF is a link state protocol that provides near instantaneous and simultaneous updates of network routing tables once a failure is detected. Other routing protocols such as Route Information Protocol only provide table updates periodically. These routing protocols take significantly longer for a routing change to be passed around.

The Travelers' tests found that once a failed route was discovered, reroute could occur within seconds. However, like most other routers, the 6611 relies on polling intervals to detect a route loss. To get a reroute within 20 seconds, polling was set to three-second intervals. At this interval, all sessions recovered on the new route. When the poll interval was set above that, some applications failed due to timers expiring.

As an added benefit, during reroute processing, the 6611 sends "Receiver Not Ready" notifications to active SNA and NETBIOS stations. This notification prevented sending stations from transmitting retry messages. Without this feature, a route failure could result in flooding of other links with retry frames, thereby spreading the outage.

Setting new standards

For operations, software maintenance and management, the IBM 6611 raises the bar for other router products. The Travelers' tests verified that the 6611 can be fully operated from remote locations, as well as managed and maintained, both in the normal and problem states. In the steady state, all operations could be done through direct connect, TCP/IP Telnet or Remote Login using the operations console.

All configurations and software maintenance could be downloaded locally using diskette or remotely using the TCP/IP File Transfer Protocol over the LAN internet.

When normal connectivity was lost, all operations could be done over a dial-in connection.

The 6611 also provides a superior set of problem determination tools. The router provides traces for the system, IP routing, Simple Network Management Protocol, system monitor, adapter, X.25, wide-area lines and bridge — each with a robust set of filters and display options.

Log records contain detailed information and can be searched by time interval, resource name, resource class, error class, error type or error identification. While other routers provide some of these features, few if any provide them all.

One feature unique to the 6611 is a system for patching software. Router software is very complex since it must be compatible with many protocols. Bug fixes and minor enhancements can generally be expected for any router product. However, most vendors issue an entire software release to fix a bug or a specific customer's problem. On the 6611, code fixes can be applied individually.

Issues remain

There are a number of shortcomings IBM will need to address in future 6611 software releases.

While the 6611 provides complete management information to the NetView/6000 via SNMP, it provides little information to LAN Network Manager. NetView/6000 fills the role of managing the router, but the 6611 does not provide token-ring management functions. It also does not forward line statistics for IBM Remote Bridges linked to the router.

Additionally, accurate status for interfaces and protocols is difficult to determine. During The Travelers' tests, the 6611 status display was not always reliable and could not differentiate between an interface that was hung, one that was in the process of activating or one that was just not active. Few parameter changes can be made without restarting the router program. There is no provision for stopping and restarting a hung resource, such as an interface, a protocol or LLC2 session. Individual components cannot be started without restarting the entire 6611 program.

The 6611 has an impressive design strategy for high performance. It uses Reduced Instruction Set Computing technology for its main CPU, and the serial and LAN interfaces. Routing IP, Novell, Inc.'s Internetwork Packet Exchange (IPX), Xerox Corp.'s Xerox Network Systems, Digital Equipment Corp.'s DECnet Phase IV and AppleTalk as well as bridging are done between interface cards and generally do not require the main CPU's services.

Leveraging this architecture, the 6611 achieves competitive aggregate throughput for IP and SRB token-ring frames passed between 6611s over a T-1 line. For SNA and NETBIOS, The Travelers determined effective throughput to be rather good for a single session. With 1,920-byte frames, it took a little less than 10 seconds to transfer 1M byte of data between two 6611s connected by a T-1, compared to about 20 seconds to do the same transfer between a pair of IBM remote bridges.

Performance stats in the table on page 38 show 6611 performance results from tests conducted by IBM, Scott Bradner of Harvard University and The Travelers. Traffic is compared at maximum frames per second in a single direction with 64-byte packets.

On the downside, other routers in the same price category achieve significantly better performance for routing IP over a LAN. Also, compared to IP, the 6611 makes it relatively unattractive to route SNA or NETBIOS over TCP/IP using its DLSw option. DLSw's maximum throughput of about 450 64-byte frame/sec would severely underutilize a T-1. Even with large frames of 2K bytes, The Travelers' tests could not fill a single T-1.

In addition, as the number of LLC2 sessions increase aggregate throughputs of the 6611 will erode. This could be a concern in large, heavily loaded IBM networks with requirements in excess of a T-1.

One solution to increase 6611 aggregate throughput for SNA and NETBIOS is to buy two 6611 Model 140's instead of a Model 170. The only significant difference between the two models is the number of slots and the price. The Model 140 has four interface slots and costs $6,395, plus adapters and software. The Model 170 has seven interface slots and costs $12,340, plus adapters and software. However, for about the same cost, two Model 140s give you double the main CPU and potentially double the aggregate throughput.

Users with large networks should also take into account the 6611's lack of hardware and systems redundancy. To IBM's credit, The Travelers' analysis found the 6611 hardware to be well designed for serviceability and RISC System/6000 components can be expected to have high mean time between failures. However, the 6611 was not built to survive failures. There are no redundant parts, the cards are not hot-swappable, and the disk drive is required for normal operations.

Stability in question

Yet another potential hurdle in deploying the 6611 in large complex networks is problems with stability. IBM's basic problem is that it tried to run before it could walk or even crawl. DLSw provides greater functionality in its first release than any other router product on the market.

Compared to routers that merely envelope SNA and NETBIOS frames, the 6611 provides significantly more sophisticated logic, including session activation, session termination, local frame acknowledgment, queue management, broadcast containment and failure recovery. Given the relatively short development time, much of the 6611 software is surprisingly stable.

However, during testing, The Travelers experienced stability problems with the 6611. The enduring problems seem to fall into two categories: problems with heavy production loads and problems getting bug-free code updates. During the tests, conducted in late 1992, the 6611 experienced problems in keeping up with the company's broadcast traffic and sporadically failed under stress. In these cases, DLSw software either hung or terminated abnormally. While these problems are a concern, IBM can be expected to make progress in correcting them.

Of greater concern, however, is why there were so many basic problems leaving IBM labs in the first place. One reason may be that it is difficult to simulate large complex networks such as The Travelers' in a lab. Yet vendors such as IBM are expected to turn around code fixes instantly. As changes were made for The Travelers, IBM's regression tests were failing to catch even basic problems.

In response to these issues, Jon Fjeld, IBM's head of the 6611 project and director of Network Routing Systems, says, "We are aware of the need to test our Data Link Switching solutions in very large and very complex SNA and LAN nets." He said his division is working with IBM's South-East Region to implement DLSw on its net.

A year after the 6611 was first announced, IBM has delivered on its promises. However, not all users may be satisfied. While the 6611 fits the profile of the customer that has multiprotocol requirements and only moderate levels of SNA and NETBIOS traffic, customers with large, diverse SNA, SDLC and NETBIOS networks with heavy traffic requirements may have to go slow before all their requirements are met. However, for this feature-rich product, it may be worth the wait. ◻

Simon is the senior telecommunications engineer responsible for implementing routers in The Travelers' network. He can be reached at (203) 277-3901.

Failure to plan spells failure

continued from page 1

from the also-rans.

Strategic planning can prevent your company from wasting precious time and money going down blind alleys and investing in incompatible, dead-end technologies.

Policies regarding strategic planning and procurement help you maximize existing IS investments and nimbly adopt new technologies. They light the way toward an information infrastructure that can easily support new applications, enabling your company to react swiftly to changes in the marketplace.

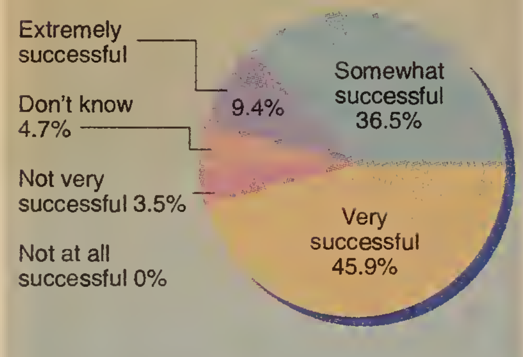
But budgets are tight, and IS staffs are expected to do more with equal or fewer resources. Technology changes at a dizzying clip. Planning falls by the wayside.

"A lot of companies are just concentrating on the day-to-day business," said John Puckett, manager of engineering and network services at The Foxboro Co., a manufacturer of process control systems based in Foxboro, Mass., that has used its strategic plan to move to an open net environment. "They don't get any medals for disrupting the current process, and they're so busy dealing with problems they simply don't have time to look ahead."

A winning strategy

Figure 2

Network executives were asked to rate how successful their IS plans have been in helping their organizations achieve strategic goals.



GRAPHIC BY SUSAN SLATER
SOURCE: *NETWORK WORLD*, FRAMINGHAM, MASS.

Avoiding the risks

While understandable, experts say the failure to plan can lead to disaster.

"If you don't have a coherent network plan in place, there are several risks you're exposing yourself to," said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

"For example, [there may be] a significantly greater requirement for equipment investment because of false starts and misdirections, and also inadequate network services, particulary during critical periods of corporate growth," he said.

A strategic plan can help a company avoid problems by making users examine every change to the network, even those that appear fairly innocuous, to ensure they will advance the company's strategy.

"You make sure that if you take a direction that diverges from the plan, that direction is challenged," Nolle said.

Case in point: A company has made the decision to wire with copper, knowing that eventual improvements in the technology will inexpensively provide adequate bandwidth for applications well into the future. But Department A decides to lay fiber to support a new application today.

The plan forces the company to cost-justify the fiber for the single project, rather than artificially writing it down over several years under the guise of a strategic investment.

"Two years later, everybody's on copper," Nolle said. "The company that installed fiber is paying 50% more for their adapters than everybody else. And every decision it makes is more complicated because it's got the wrong kind of horizontal wiring. That's a problem a strategic plan can avoid handily."

Often, companies don't think about planning until they are faced with a herculean project such as consolidating networks after a merger or acquisition.

"A single department is charged with getting the whole company tied together, and they throw up their hands because there are too many variants. That's when a central plan gets put in place," said Michael Howard, president of Infonetics Research, Inc., a market research firm in San Jose, Calif. "That's backing into it. It's more like crisis management than strategic planning. But unfortunately, that's the way it happens in a lot of companies."

According to Nolle, 40% of the user companies CIMI conducts surveys for have no documented net strategy and many of those that say they do don't have real, structured plans in place.

"Of the 60% that believe they have a strategic plan, we would agree with that in no more than 20% of the cases," Nolle said. "That means only 12% of the total would actually have met our requirements for a plan."

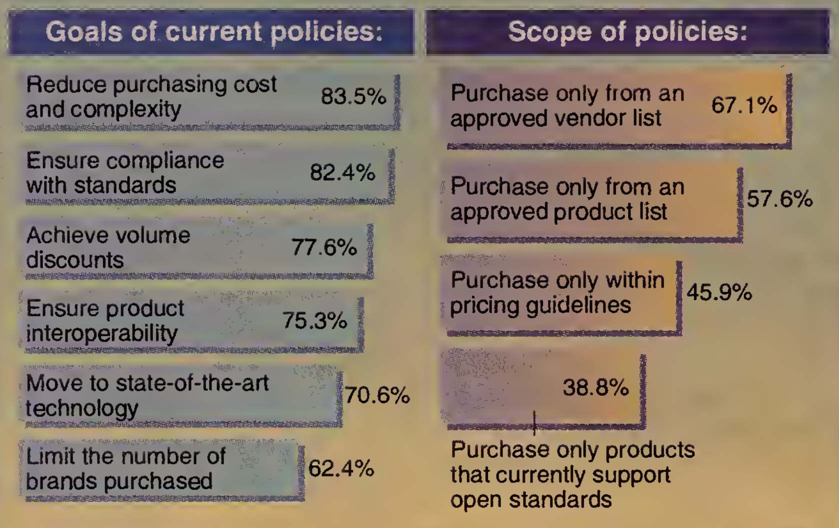
Similarly, Infonetics found that 59% of the users it surveyed didn't have formal network management strategies in place.

"The number of organizations around the world that have strategies to build an enterprisewide infrastructure is growing but is still a small percentage," agrees Ralph Ungermann, president and chief executive officer of Ungermann-Bass, Inc. Ungermann puts the number at about 25% of all companies purchasing local-area networks today.

Controlling the buy

Figure 3

Users were asked why they instituted IS procurement policies and how stringent those policies are.



GRAPHIC BY SUSAN SLATER

SOURCE: *NETWORK WORLD*, FRAMINGHAM, MASS.

But the companies that commit to planning are seeing big benefits, he said. For example, firms in the financial industry tend to adhere strictly to strategic guidelines, and "their cost of ownership is probably a tiny fraction of the cost of the average organization's — maybe as low as one-sixth — because they didn't let this random stuff go on," he said. "They don't have hundreds of people running around fixing stuff, while nobody even knows they are there."

Strategic planning is even more critical as users move toward distributed computing, said Jonathan Gossels, a top executive with Cambridge, Mass.-based Open Software Foundation, Inc., which is developing the Distributed Management Environment and Distributed Computing Environment.

"Users must develop a technology plan, they have to develop migration strategies, and they have to codify them into procurement specifications so that every purchase moves them in the right direction," he said. "They have to recognize they have a responsibility in this."

Why we plan

In order to get a better grasp on why users institute strategic plans and how they benefit companies, *Network World* surveyed 100 large companies — those spending between $1 million and $4.9 million a year on network products and services.

According to the survey, users with strategic plans update them an average of once a year, and the plans generally extend five years.

The impetus for implementing a strategic plan is varied (see graphic, page 1). The prime goals are to achieve interoperability among current systems, move to open standards and improve interdepartmental communications. Although reducing IS expenditures was not the top goal of strategic planning, lower costs are inevitably a result of strategic net planning, experts say.

"The biggest advantage in having a strategic plan is consolidating technologies," Infonetics' Howard said. "This enables you to have interoperability among departments and saves you on training. That translates into real savings of time and money."

When asked if their plans were helping them achieve strategic goals — such as cost savings — the users surveyed illustrate Howard's point (see Figure 2, this page).

But no plan can truly be successful without a mechanism for ensuring adherence.

"The [companies] that are going to have a competitive edge are the ones that start early, develop a plan and stick to it," OSF's Gossels said. "The ones that are all over the map are going to be hurt."

In many companies, this control mechanism takes the form of a centralized procurement strategy, which *NW* readers have implemented for a variety of reasons, including reducing costs and ensuring compliance with standards (see Figure 3, this page).

"Supporting standards is critical," Puckett said. "With standards-based solutions, you just connect stuff together — you don't have to go through gateways and all that. That's efficient."

The study found that among those companies with procurement policies, there are times when the rules can be broken — for example, when a product has features unavailable in products that meet procurement guidelines (see Figure 4, this page).

Flexibility is just good sense. A plan that is too rigid can be worse than no plan at all.

"A real strategic plan focuses on change," Howard said. "Make sure the base you're working from can support change or evolution to the next technology when it's available."

Nolle agrees. Rather than committing to a specific technology, such as Asynchronous Transfer Mode, "the user should be making a commitment to an operating policy — a business practice — which suggests an information systems policy, which then dictates a network strategy. If the user gets too specific, then he constrains the technical processes with unreasonable requirements, and that results in nonoptimal solutions. That's how you end up buying LANs that cost $8,000 a port."

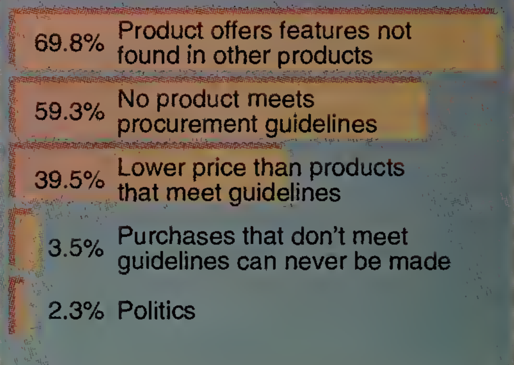
Not for me

Still, some users don't see the need for a plan. "We don't have a formal strategic plan, and we don't plan on developing one," said Charles Ashley, director of data processing technical services at the Texas Employment Commission (TEC) in Austin. "We know that we'll be increasing speeds and capacity incrementally, and we're planning for that. But we don't have any plans for any future changes in the way our network is set up. There just isn't a need."

How strict are procurement policy guidelines?

Figure 4

Users were asked when a purchase can be made that doesn't fit with their procurement policy.



GRAPHIC BY SUSAN SLATER
SOURCE: *NETWORK WORLD*, FRAMINGHAM, MASS.

Ashley said TEC has its hands full with its current network, adding that building a strategic plan for the future is just not a priority. "The world is in such a state of flux that whatever we set down would be out-of-date by the time it was put in place," he said.

Other users sympathize with Ashley's position but say the benefits to planning outweigh the short-term disadvantages.

"I sympathize with people who say they're too short-staffed and overworked to worry about formulating a network plan," said Judy Weimer, a systems analyst at Armor-Kone Elevator Co. in Louisville, Ky. "But planning saves you from running around fighting fires."

Weimer's firm has already seen the benefits of strategic planning. "We were able to wire our new building in such a way that it would support the terminals we were using then and the PC LANs we'd be using in the future. And we were able to keep tight control of all the software we use across the company. In the end, it saved us a lot."

A simple message

As earlier *NW* Reader Advocacy Force articles illustrate, network vendors have a lot to do to resolve the problems inherent in building enterprise networks. But strategic planning is one task that rests solely on users' shoulders.

In order to realize the promise of enterprise networking and position their companies to prosper in a increasingly competitive future, network and IS executives have to tackle the tough job of strategic planning. Users with strategic plans wield great influence in shaping vendor decisions and product offerings.

The ability to translate business goals into a strategic technology plan may be the most valuable skill an IS manager can develop — more important to long-term success than hands-on experience with even the most cutting-edge technology.

Experts say that no matter how much time users invest in strategic planning, the payback always makes it worthwhile.

"Whatever investment it takes at the front end will always pay back within a year," Infonetic's Howard said. "And it always pays back with a strategic edge."

According to CIMI's Nolle, "If your organization has a plan in place that can adapt very rapidly to change, then you are going to be in an optimally competitive position, which means be able to eat some market share at a time when others are foundering." ▣

How to formulate a strategic plan

Analysts and users agree the first step in strategic planning is to clarify the assumptions on which your plan will be based — to understand where you really need to go. Technology managers have to get detailed information from upper management about business directions.

"You have to get consensus on directions, which means you have to sit down with people who are responsible for making operating decisions, for making the money," said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J. Those business decisions then need to be translated into information systems (IS) requirements.

For example, say branch offices will be given more autonomy in hopes of making the company more responsive to customer needs.

Such a shift translates into a need for more processing power in the branches, more network capacity and, perhaps, less demand for computing power at headquarters.

But realizing a need for more computing power on remote users' desks is not enough. Managers need to quantify the increase and turn it into concrete requirements.

Workstations providing 200 million instructions per second of processing power may be available three years down the road, at a cost of, say, $14,000. But that price needs to be measured against the expected return in productivity.

Then, the IS executives need to ask some tough questions about increases in transactions and new applications.

That information shapes a network blueprint covering such items as topologies, delay characteristics and performance requirements.

"It's not easy," Nolle said. "It's like moving a rope by pushing at the bottom."

Strategic plans are a general way of ensuring the whole company is headed in the same direction. "When you develop the plan, you're saying to your organization, 'Here's a road of X width and X direction, and you may be anywhere on this road under local authority. But when you step off the curb and onto the grass, you are threatening the company's strategic direction,' " Nolle said. ▣

— Joanne Cummings

A fresh outlook on outsourcing

continued from page 37

outsourcing services will need to support multimedia and voice applications as well as a wide variety of multivendor and multiprotocol environments.

Carriers will need to expand their outsourcing offerings to include more data-based networking, which could result in users getting better service levels at near commodity prices.

Todd Dagress, an analyst at The Yankee Group in Boston, says it'll be the next century before data services become the commodity that voice services are today. Voice users all need the same things, Dagres says. "They want to hear clearly and they want a dial tone." But diverse computer applications have different data transfer requirements so carriers will have to learn to manage down to the desktop and convince companies they can do it better than anyone else, he says.

In the meantime, users are finding that modular outsourcing gives internal staff more time to work on network-based business applications rather than fighting fires.

Patch is a free-lance writer based in Boston, and Turner is a principal with Northeast Consulting Resources, Inc. where she provides strategic and technical planning to end users and vendors in the areas of internetworking, global services and outsourcing.

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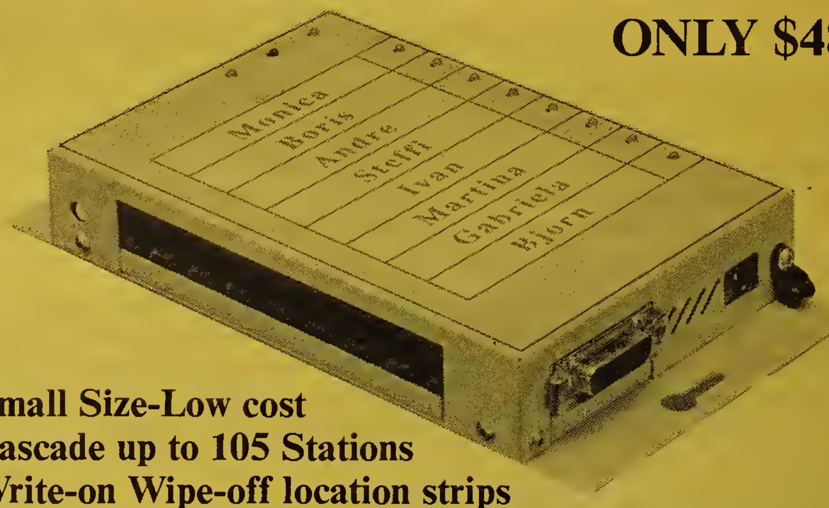

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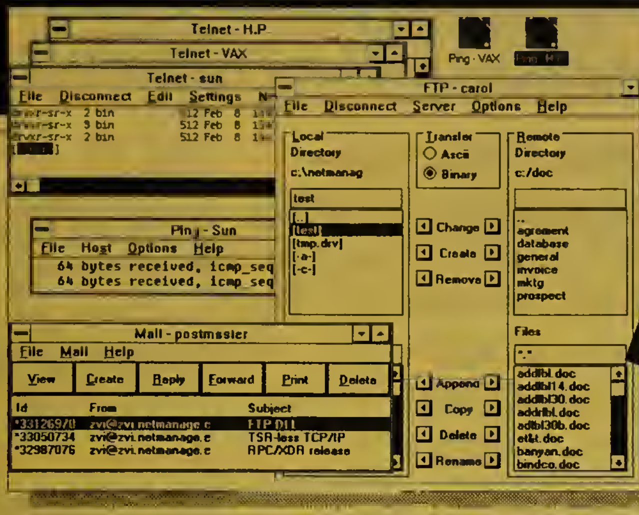


```
drwxr-sr-x  2 bin        512 Feb  8
drwxr-sr-x  3 bin        512 Feb  8
drwxr-sr-x  2 bin        512 Feb  8
```

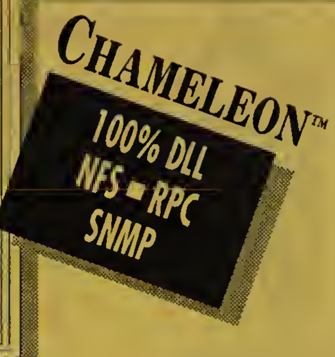
```
64 bytes received, icmp_seq
64 bytes received, icmp_seq
```

```
test
[..]
[test]
[tmp.drv]
[-a-]
[-c-]
```

```
..
agrement
database
general
invoice
mktg
prospect
```

```
*.*
addlbl.doc
addlbl14.doc
addlbl30.doc
addrlbl.doc
adlbl30b.doc
at&t.doc
banyan.doc
bindco.doc
```

```
Id          From                   Subject
*33126970   zvi@zvi.netmanage.c    FTP DLL
*33050734   zvi@zvi.netmanage.c    TSR-less TCP/IP
*32987076   zvi@zvi.netmanage.c    RPC/XDR release
```



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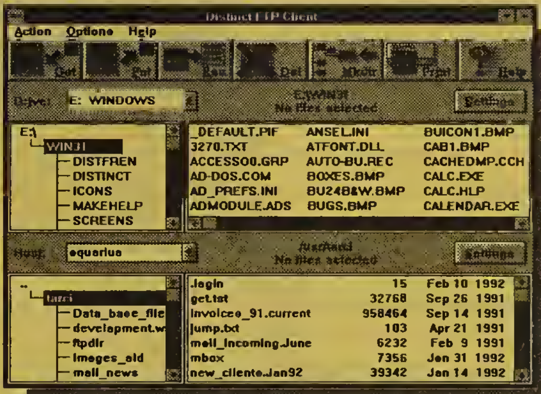

```
E:\
 └WIN31
   ├DISTFREN
   ├DISTINCT
   ├ICONS
   ├MAKEHELP
   └SCREENS
```

```
_DEFAULT.PIF    ANSEL.INI       BUICON1.BMP
3270.TXT        ATFONT.DLL      CAB1.BMP
ACCESS00.GRP    AUTO-BU.REC     CACHEDMP.CCH
AD-DOS.COM      BOXES.BMP       CALC.EXE
AD_PREFS.INI    BU24B&W.BMP     CALC.HLP
ADMODULE.ADS    BUGS.BMP        CALENDAR.EXE
```

```
..
 └tarzi
   ├Data_base_file
   ├development.w
   ├ftpdir
   ├images_old
   └mail_news
```

```
.login                      15   Feb 10  1992
get.txt                  32768   Sep 26  1991
invoices_91.current     958464   Sep 14  1991
jump.txt                   103   Apr 21  1991
mail_incoming.June        6232   Feb  9  1991
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new_clients.Jan92        39342   Jan 14  1992
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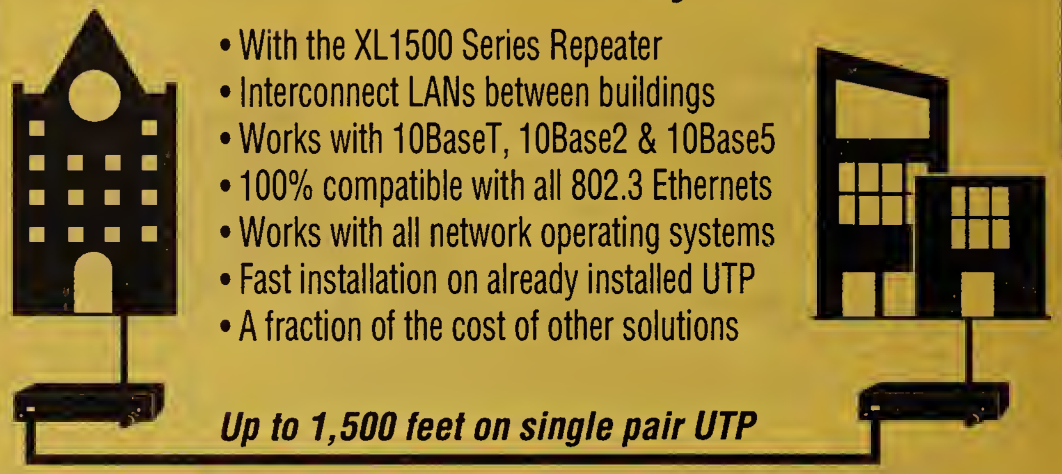

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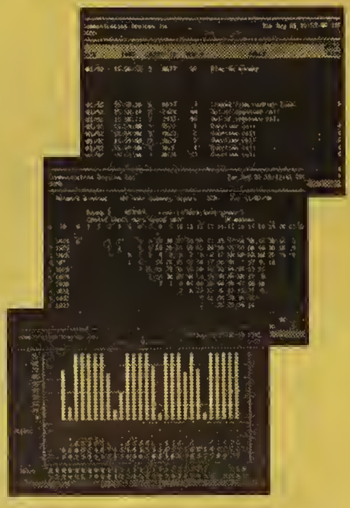

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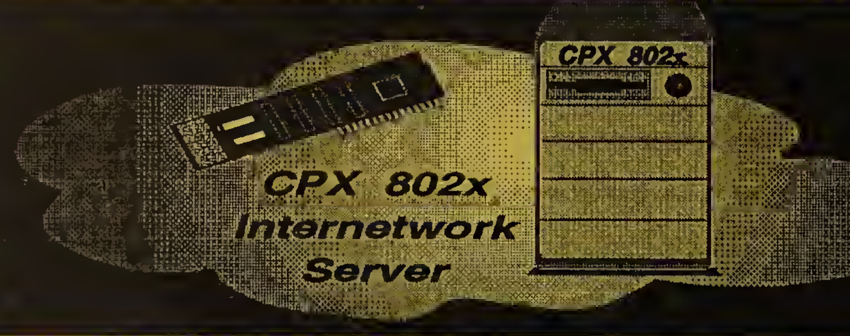

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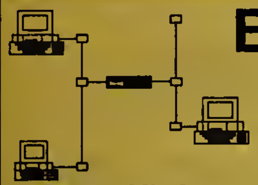

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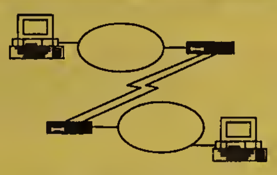

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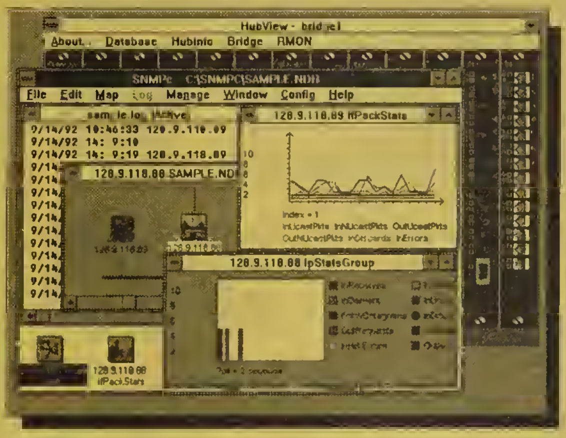
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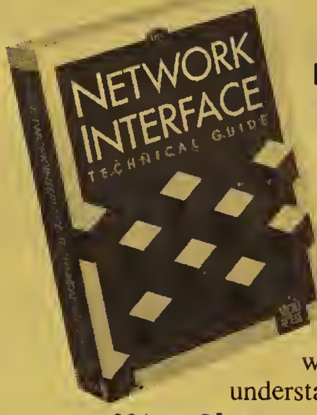

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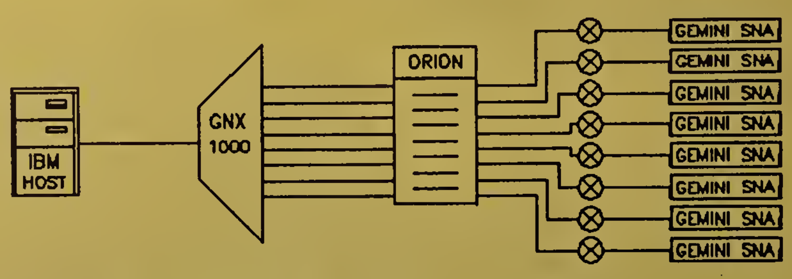

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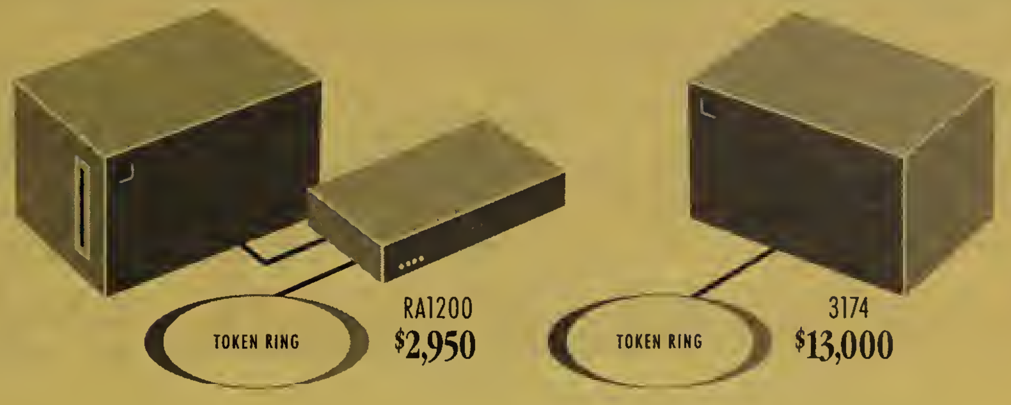

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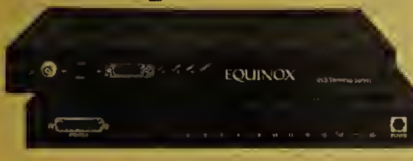

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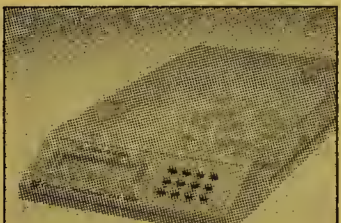

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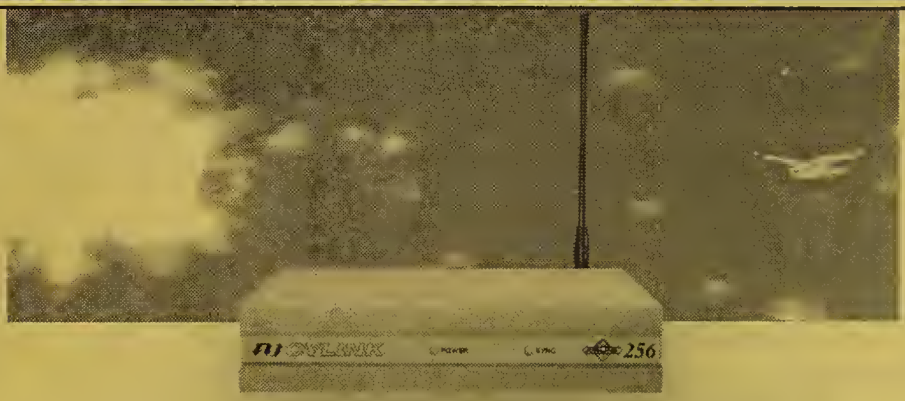

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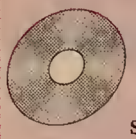

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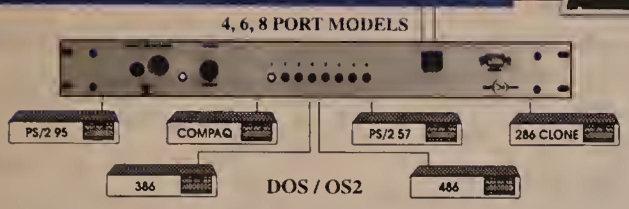

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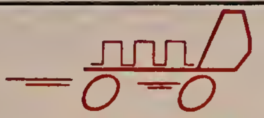

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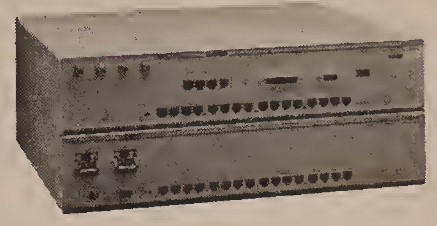

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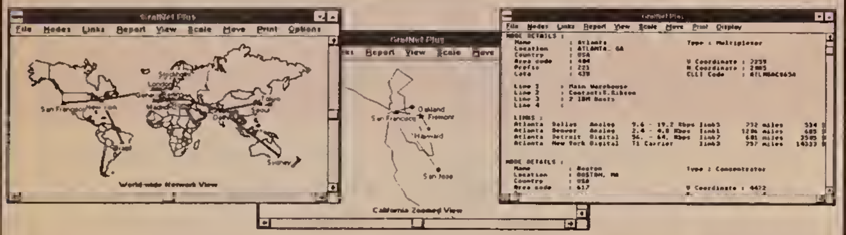
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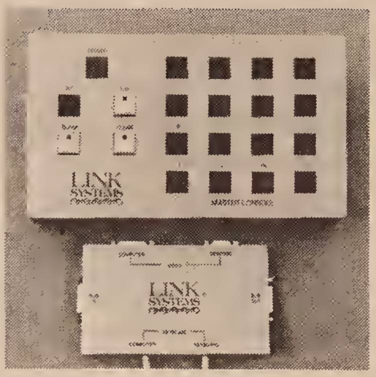

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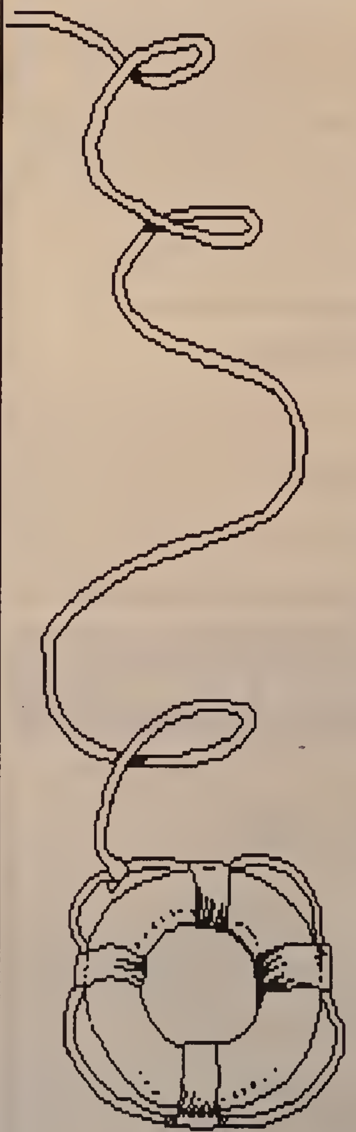

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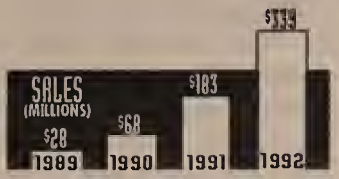

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HEWLETT PACKARD

Novell gets a hot new ally in Powersoft

continued from page 1

and alliance programs in Burlington, Mass. "This tool gives them a high-level, object-based interface to NetWare services."

Powersoft and Novell are demonstrating a beta version of PowerBuilder Library for NetWare this week at the Software Development '93 Conference and Exhibition here. Powersoft is developing the tool with input from Novell, and both companies will market it.

According to Brad Cooley, manager of systems support in the agricultural division at Ciba-Geigy Corp. in Greensboro, N.C., PowerBuilder Library for NetWare will make it easier for developers at his firm to identify logon names, media access addresses and print queues on the net.

"The tool will make our developers more efficient and enhance PowerBuilder functionality," he said. "It's time they gave [client/server developers] what's always been available on the mainframe and other platforms.

PowerBuilder Library for NetWare represents another move by Powersoft to boost PowerBuilder to handle enterprise client/server applications. Powersoft has already announced agreements with two leading computer-aided software engineering vendors — LBMS, Inc. and Bachman Information Systems, Inc. — to build interfaces to their products.

Good news for Novell

The announcement also plays well for Novell, which is trying to establish alliances with software vendors whose tools can make it easier for users to build applications on NetWare networks. Last month, Novell announced it was working with HyperDesk Corp. to develop an object-based interface to NetWare services.

"We've always provided procedural [application program interfaces] that require crack C programmers to develop NetWare applications," said Willie Tejada, director of business development at Novell in Austin, Texas. "Now we want to deliver higher level tools that make it easy for corporate developers to create these applications."

Ciba-Geigy's Cooley was also pleased with PowerBuilder's support for Btrieve and NetWare SQL. Powersoft is using Microsoft Corp.'s Open Database Connectivity (ODBC) interface to provide access from PowerBuilder to the Novell databases.

"Building in ODBC support is a real good move," Cooley said. "ODBC gives us a quick and dirty approach to getting back-end data. We have a lot of Btrieve, and it would be good to get at it from PowerBuilder."

PowerBuilder Library for NetWare will be available midyear, concurrent with the release of PowerBuilder 3.0, said Powersoft's Critch. Support for Btrieve and NetWare SQL will be part of the PowerBuilder 3.0 announcement, he added. No pricing was available. ◘

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Sprint offers dedicated network

continued from page 4

up that, then the service should be very attractive. "Most retailers have been trying to get the response time down, and 10 to 12 seconds sounds good," he said.

Sprint will offer local 950 access for the TranXact network. Typically, POS devices are connected to a host computer over 800 lines, which are slower because the local carrier must do a lookup to determine the terminating location and carrier.

With local 950 access, calls can be sent to the terminating location immediately.

But for users who still want to dial in over 800 numbers, Sprint made other enhancements to cut response time. Sprint worked with Northern Telecom, Inc. to develop software that more closely links the switches in its voice network to the TranXact network, according to DeAngelo.

Additionally, the Primary Access controllers will be preprogrammed with routing information to speed calls.

Sprint said the TranXact services will be less expensive because of the way rates are structured. Users pay one charge for the first six seconds and for each one-second increment after that. DeAngelo said other networks bill in six-second increments.

He also said Sprint plans to target TranXact services to existing customers, but the carrier will also seek users of some emerging applications, such as electronic delivery of state and federal benefits, processing of health care transactions and wireless applications.

Chay said users will have to wait and see how TranXact pricing compares to other services. He pointed out that there are two groups — Retex and Spectranet — that buy service in bulk so smaller retailers can obtain volume discounts. ◘

Client/server is painfully maturing

continued from page 4

zationwide level, while less than one-third of the users will implement client/server on a divisional, departmental or work group basis.

"When users move client/server beyond the departmental level, they have to contend with a wider range of platforms, databases and networks, which adds to the complexity of designing and managing applications," Roy said.

The survey says a majority of users (64%) currently integrate products from different vendors to support client/server applications. Most of these users will be forced to hire outside developers with specialized expertise to integrate new and existing applications, slowing their client/server rollouts, he said.

The survey also shows many companies are moving to client/server computing to automate manual tasks (52%), develop mission-critical applications in-house (45%) and allow end users to build their own custom reports (41%). The most common client/server applications being deployed are decision support, finance, messaging, document management and imaging (see graphic, page 4).

One firm trying to stay a step ahead of the problems associated with client/server computing is JP Morgan & Co. in New York. B.J. Choi, a network manager at the bank, has been assigned the task of implementing organizational practices, policies and tools to manage and support the bank's global rollout of client/server applications, which is now under way.

Besides the lack of systems and problem management tools, Choi said one of his biggest challenges is trying to assess the impact client/server computing will have on the bank's network. "Client/server computing imposes tremendous demands on the network that vary depending on the architecture of the network, underlying protocols and the way developers split logic and data among clients and servers," he said.

He also said rolling out client/server applications globally is extremely costly.

"We are trying to develop a methodology to streamline the process and achieve economies of scale," Choi said.

Choi added that JP Morgan is not second-guessing its decision to migrate to client/server but is moving slower than anticipated to ensure it's addressing the major issues involved in the migration. ◻

Lack of rules may hurt 800 portability

continued from page 5

Corp. last November jointly met with FCC staff and asked them to impose a 48-hour time limit. But until Allnet filed the petition last week, no one had officially pushed the FCC for action.

MCI and Sprint last week said they support Allnet's petition.

Jeffrey Seldman, director of planning for 800 services, said AT&T would also support Allnet's call for a 48-hour turnaround "as long as it starts after the paperwork is completed."

Jones said Allnet's general fears have been heightened by recent practical experience with AT&T in a technical arrangement that mimics 800 portability. Under that arrangement, customers dial an 800 number and the local carrier routes the call to AT&T's network.

Allnet has an Integrated Services Digital Network link to AT&T's network, which it uses to strip off 800 calls bound for customers wanting traffic completed on Allnet's network, an option AT&T is legally bound to provide through tariff.

For 80% of the customers that filled out change orders, Jones said, AT&T has taken more than 22 days to complete the switch, which involves nothing more than a software change.

As an explanation for the delays, AT&T often told Allnet that paperwork was not properly filled out, according to Roy Morris, deputy general counsel at Allnet.

Feeling it in the pocketbook

Another AT&T tactic hit users in the pocketbook, Jones said. "Before it would process the [change] order, AT&T forced customers off of their term plan, which raised the customer's rates," he said. Then, if it took several months for AT&T to carry out the change, the customers ended up having to pay higher rates.

According to an AT&T spokesman, the standard provisioning interval for 800 service is 17 to 20 days so Allnet's experience was not out of the ordinary. He also said there was a huge increase in orders from Allnet, going from 10 a month to almost 500, which initially caused a backlog.

There is no connection between AT&T's Allnet arrangement and the turnaround time users can expect when 800 portability becomes reality, he said. ◻

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Vendors of intelligent wiring hubs may not submit entries to this survey.

1. On a scale of 1 to 10, with 10 being the most important, please rank the following service and support issues you consider when purchasing intelligent wiring hubs. No two items may be rated the same.
   ____ Conformance to standards
   ____ Ease of use
   ____ Interoperability with other vendors' hubs
   ____ Mean time between failure
   ____ Network management capabilities
   ____ Performance
   ____ Price
   ____ Product is part of a broad line of offerings from one vendor
   ____ Reliability
   ____ Other (please list) ____________

2. Of those, which is the single most important factor that influences your purchase decision?
   ____

3. Please tell us which intelligent hubs you use today in your network. Please list up to three vendors and specific models.
   1. ____________
   2. ____________
   3. ____________

4. Of those brands, which came closest to meeting all your selection criteria?
   ____

5. Which of these brands would you recommend to other users? Why?
   ____

6A. Of those brands you have installed, which model has been the most reliable? ____________

6B. Which has offered best performance? ____________

7. Of the following service and support criteria, please rank the three most crucial service and support issues.
   ____ Disaster recovery
   ____ Ease of installation
   ____ Maintenance/upgrade programs
   ____ Next day availability of replacement parts/units
   ____ Remote monitoring
   ____ Toll free 800 help line
   ____ Other (please list) ____________

8. Which of the hub vendors that you use best meets your needs for service and support?
   ____

9. What is the highest price you are willing to pay per port for an intelligent wiring hub?
   ____

10. What type of discount do you expect for a volume purchase? (Please state the discount and the number of hubs for which it applies.)
   ____

Thank you for answering the questions above. To complete your FaxBack survey, please fill in the information below. Network World will not publish your name or company affiliation. However, we do require this information to validate survey results and to ensure our pool of respondents is comprised solely of user responses, not entries from vendors. Thank you for your assistance and your interest in Network World.

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Medical firm finds SMDS deal

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to establish links as needed with business partners and others.

From a cost standpoint, a meshed T-1 network will be cheaper than SMDS for nets of up to four sites, Lucas said. Beyond that, SMDS is a better deal because one link provides connectivity with all other sites, in effect creating a meshed net (see graphic, this page).

"We see four sites in a metropolitan area as the breakpoint for SMDS," agreed David Kirkow, broadband services manager for US West. "We expect any users with more than that to eventually move to SMDS."

Although the regional Bell holding companies' SMDS rates vary somewhat, Kirkow said the breakpoint does not. Breakpoints for interexchange SMDS cannot yet be determined as only MCI Communications Corp. offers the service and it has not yet announced rates.

CDI's network connects diagnostic imaging clinics at its Chicago Avenue South, Riverside and Mendota Heights sites to its St. Louis Park headquarters, all within Minneapolis.

Magnetic resonance imaging (MRI) or CAT scan devices pass images over a proprietary serial interface to an adjacent Data General Corp. machine.

Radiologists at each site access images using Sun Microsystems, Inc. workstations attached to Ethernet local-area networks, which in turn are connected to the SMDS net via Cisco Systems, Inc. routers and ADC Kentrox channel service units.

CDI is getting set to add new sites to its SMDS net, not to mention the offices of medical specialists outside the company, Lucas said. "We think we can change the way we do business by opening up the network to interested [business] partners."

User chooses SMDS over T-1

Dedicated T-1 (hub and spoke)	Data service unit	Router	Monthly service charge	Monthly* equipment charge	Monthly total
St. Louis Park hub site	$5,985	$19,850	–	$917.63	$917.63
Mendota Heights	$1,995	$5,000	$740	$194.30	$934.30
Chicago Avenue South	$1,995	$5,000	$700	$194.30	$894.30
Riverside	$1,995	$5,000	$700	$194.30	$894.30
Subtotal	**$11,970**	**$34,850**	**$2,140**	**$1,500.53**	**$3,640.53**
Each new site	**$3,990**	**$5,000**	**$700**	**$249.72**	**$949.72**
Meshed SMDS net	**Data service unit**	**Router**	**Monthly service charge**	**Monthly equipment charge**	**Monthly total**
St. Louis Park	$6,000	$5,000	$608	$305.55	$913.55
Mendota Heights	$6,000	$5,000	$608	$305.55	$913.55
Chicago Avenue South	$6,000	$5,000	$608	$305.55	$913.55
Riverside	$6,000	$5,000	$608	$305.55	$913.55
Subtotal	**$24,000**	**$20,000**	**$2,432**	**$1,222.20**	**$3,654.20**
Each new site	**$6,000**	**$5,000**	**$608**	**$305.55**	**$913.55**

Although a fully meshed SMDS net costs slightly more than a hub-and-spoke T-1 configuration, it is less expensive to add dedicated network sites with SMDS.

*Cost of hardware is amortized over 3 years.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: CENTER FOR DIAGNOSTIC IMAGING, MINNEAPOLIS

IBM expands AS/400 mgmt.

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400 and Automated Facilities/400 — that can manage a single AS/400 or a network of AS/400s from a hub machine.

Omegamon/400 runs on an OS/2-based personal computer linked to an AS/400 and graphically presents a network status map showing alerts and alarms provided by OmegaView/400. OmegaView/400 runs on the AS/400 and continually monitors performance degradation, slowed response time and excessive CPU usage. It has an object-oriented database that can store management data.

Once an alarm is exhibited, an administrator can manually resolve the problem or let the Automated Facilities/400 software — which must reside on each AS/400 being managed — kick off an automated response.

Omegamon Services/400 costs between $1,000 and $26,500. OmegaView/400 is priced at $15,000, and Automated Facilities/400 costs from $1,250 to $33,150. All three will be available in December.

"Candle has some of the best systems management technology on the market," said Mark Peterson, director of market research for ADM, Inc., a consultancy in Cheshire, Mass.

To further its client/server strategy, IBM announced the AS/400 Client and AS/400 Server Series line of prepackaged client/server applications.

The AS/400 Client Series includes third-party applications and development tools for networks of DOS, OS/2 and Windows clients linked to AS/400s.

Initially, three IBM products and offerings from five software developers are bundled in the series. They include products from Gupta Corp., Progress Software Corp. and Synon Corp. For example, Synon will offer its Client/Server Generator, an OS/2-based computer-aided software engineering tool that will help users downsize mainframe applications to run on AS/400 servers and OS/2 clients.

Apple Computer, Inc. announced a new version of the SNA•ps 5250 emulator. The new emulator, developed jointly with IBM, lets Macintosh users access applications on the AS/400. It will be available in June for $395.

Under the AS/400 Server Series, IBM will offer turnkey packages of preconfigured AS/400 and Personal System/2 hardware, as well as applications, that give users plug-and-play client/server offerings. It includes adapter cards for IBM Token-Ring or Ethernet LANs.

Analysts said these offerings will be especially useful for small and midsize users that do not have the expertise or money to develop full-blown client/server implementations.

IBM also announced:

- A statement of direction to build adapters that link the AS/400 to 100M bit/sec Fiber Distributed Data Interface LANs over fiber-optic and shielded twisted-pair wiring.
- A statement of direction to port the firm's AS/400-to-RISC System/6000 connectivity software, the AIX AS/400 Connection Program/6000, to Sun Microsystems, Inc., Hewlett-Packard Co. and other vendors' Unix platforms to enable those devices to communicate with the AS/400.
- A Distributed Computing Environment (DCE)/400 tool kit that lets users begin developing DCE-compliant applications.
- TCP/IP File Server, an implementation of Sun's Network File System (NFS) that lets NFS users access AS/400 files. It is available now for $220 to $5,830, depending on configuration.

In addition, Oracle Corp. announced it will develop an SQL*Connect gateway that will enable users to exchange information among Oracle and AS/400 databases. The gateway is expected out in December. Pricing was unavailable.

Cascade to round out line

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The switch also supports frame relay and Switched Multimegabit Data Service interfaces and the Open Shortest Path First routing protocol for frame and ATM virtual circuit establishment. Frame relay can operate at T-3 rates, Cascade said.

But the unique features of the switch, according to analysts, are its ability to use switched lines for switch-to-switch connections and to vary the size of data packets for improved transmission.

The switched internodal trunk feature is called OPTimum, or Open Packet Trunking. OPTimum enables users to string together switches using services such as frame relay, ATM and SMDS instead of more expensive leased lines.

The variable frame feature is called QuickPath. QuickPath allows users to access frame relay services to send non-delay-sensitive data, such as electronic mail and file transfers, and fixed cell length services such as ATM for transmitting delay-sensitive information.

Cascade officials confirmed that they will announce a broadband switch this week but declined to comment further.

The B-STDX will cost between $30,000 and $160,000 and will ship in October.

MCI to offer links to U.K.

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With International Switchband, users need a multiplexer compatible with Mercury's net switches, and T-1 or E-1 (2.048M bit/sec) access links at each end of the international line.

MCI already offers International 64, a switched data service that could be multiplexed to higher speeds but requires users to make separate access calls for each 64K bit/sec channel used. Furthermore, these calls are carried on either fiber or satellite links, while International Switchband will be a fiber-only service.

The carrier said the service will be available in April, but would not divulge pricing. It did say the cost of an International Switchband link will be substantially less than the equivalent number of International 64 connections.

Singh said the contiguous bandwidth will likely be used for applications, including local-area network interconnection, videoconferencing and imaging.

Based on testing results with users, MCI may make the service available in additional countries later this year, Singh said.

The carrier is considering offering the service to Belgium, Denmark, Finland, the Netherlands, Norway, Sweden and Switzerland.

Eicon to ease net headaches

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other gateway vendors to follow," said Dick Boyle, program director for local-area communications at Gartner Group, Inc., a Stamford, Conn., consultancy. "Many users can't afford to install all of the separate technology the ICS supports at one time."

Multimedia pack

The ICS is software will work with machines attached to token-ring, Ethernet and Fiber Distributed Data Interface LANs.

Wide-area connectivity is provided by Eicon's existing intelligent communications cards, which fit into any IBM Micro Channel Architecture or Industry Standard Architecture personal computer. The communications cards support a single V.24, V.35 or X.21 interface and SDLC, X.25, frame relay or Integrated Services Digital Network links at speeds up to 384K bit/sec.

Additionally, the ICS is able to support a maximum of six cards on any platform. These cards range in price between $1,095 and $1,595.

Three-phase process

The ICS will be rolled out in phases during the next 18 months. The first release, available in May, will run on NetWare servers as a NetWare Loadable Module. It will be able to route the Transmission Control Protocol/Internet Protocol, Apple Computer, Inc. AppleTalk and Novell, Inc. Internetwork Packet Exchange (IPX) protocols.

The software will also support the Point-to-Point Protocol to route data to larger router systems such as those from Cisco Systems, Inc. and Wellfleet Communications, Inc.

Also included in the ICS will be an SNA gateway function that supports as many as 254 SNA 3270, 5250, LU 6.2 or LU 0 Eicon sessions per card, with a host for DOS, Windows, OS/2, Macintosh, Unix and Windows NT clients.

A second ICS release, due out in September, will run on IBM's OS/2 servers. It will add the conversion capability so that the software can convert SDLC data from as many as 16 IBM 3174 controllers into the LLC2 format required for communications across Ethernet, token-ring and FDDI LANs.

That relase will also include support for routing Network Basic I/O System traffic over SNA nets and X.25 wide-area links.

The third release, which is expected out in early 1994, will support Unix and Windows NT servers, as well as IBM's Data Link Switching.

At an unspecified time, Eicon plans to add support for IBM's Advanced Peer-to-Peer Networking End Node as well as source route transparent bridging and the Open Shortest Path First interrouter protocol.

The ICS will cost between $3,000 and $5,000, depending on configuration.

Analysts said the product sounds goodm — if Eicon delivers as promised.

"Eicon has a huge wish list of features to support," said Lucinda Santisario, a senior analyst at International Data Corp. in Framingham, Mass. "They also need to deliver quickly on their promise of operating system independence." ◻

Treasury to use digital signatures

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fices nationwide issuing public-key certificates to both government employees and trading partners. The certificates, stored in an X.500-based certificate directory, would not be compatible with Privacy Enhanced Mail (PEM)-based certificates, which use RSA Data Security, Inc. algorithms (see "Group devises new system for public-key certification, page 23).

Other agencies, including the National Aeronautics and Space Administration, the Office of the Secretary of Defense and the National Security Agency (NSA), also outlined plans at the NIST symposium for deploying DSS.

But DSS is not yet an actual federal standard, and uncertainties remain. Since NIST proposed DSS as the nation's first public-key standard in July 1991, the technology has been widely criticized as half a standard since it does not provide for encrypting documents.

DSS only contains the Digital Signature Algorithm (DSA) for creating a public-key signature and a Secure Hash Algorithm (SHA) for creating message digests that can be compared to original messages in order to safeguard against tampering.

NIST last summer admitted that the NSA actually created DSS, which cost NIST some credibility with companies that feel the NSA is willing to sacrifice their business interests for national security goals.

Patent disputes have also erupted over DSS, with RSA Data Security and German university Professor Claus Schnorr both claiming DSS violates their public-key technology patents. But last week, NIST officials said it intends to push DSS out as a standard in three months even if the patent claims are not resolved.

> "APPN has not yet shown itself to be a superior routing protocol," Simon said.
>
> ▲▲▲

Miles Smid, manager of the NIST Security Technology Group, said NIST has already sent one piece of DSS — the SHA digest algorithm — to Secretary of Commerce Ron Brown for final approval, placing the fate of DSS in the hands of the Clinton administration.

If signed, a new regulation taking effect in six months would require federal users to buy SHA-based products when they need to purchase products with message digest functionality. If the commerce secretary approves SHA, DSS will be halfway home as a standard.

The government intended DSS to be royalty-free, he said, but until patent disputes are resolved, this issue remains questionable.

"We have an urgent need to start utilizing DSS immediately," Philcox said. "But DSS product acceptability and availability are important missing ingredients." He acknowledged that the Treasury Department will have to confront the issue of other public-key encryption algorithms, including those from RSA Data Security, the de facto standard. "We may have to support more than one standard," he said.

Philcox also said the Treasury Department would like to clear up disagreements abounding in the legal profession about the validity of an electronic vs. written signature on a contract. The IRS will submit legislation to Congress making digital signatures unequivocably acceptable under the law.

He noted that the Treasury Department had mustered Congressional support to attach such a clause in last year's tax bill, but President Bush vetoed the bill before leaving office because it would have raised taxes. "We expect that passage of a bill would give us authorization for the prototypes we are working toward," Philcox said. ◻

AT&T boosts support for nets

continued from page 1

viders' service and support.

"AT&T has moved to a new level of service and support for SDN," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "And they've turned up the heat on MCI and Sprint to match their plan."

Under the first service, SDN Assurity, the carrier provides network managers with monthly reviews designed to identify changes in network traffic and performance. Specialists will also review call completion and trunk usage on a quarterly basis to see if design changes are warranted.

Factors considered in design recommendations include migration from switched to dedicated SDN access and local access and transport area-pair analysis. In a LATA-pair analysis, AT&T checks to see if an SDN customer makes enough calls between sites with dedicated access to warrant lower rates on those calls.

With SDN Assurity, customers decide where bills are sent, when they should arrive and how much detail they should include. Staff at AT&T's dedicated SDN Control Center (SDNCC) in Atlanta helps users understand bills, resolve disputes and answer inquiries.

SDN Assurity is free of charge to current and new customers.

"I just don't understand what kept AT&T from offering this service earlier," Volante said. "It's something that most every SDN customer could use."

For users that want higher levels of support, AT&T will offer SDN Assurity Plus. In addition to the standard facilities monitoring handled with SDN Assurity, the carrier will coordinate the resolution of network troubles with the customer's equipment vendors.

When an outage occurs as a result of on-site equipment, the SDNCC acts as the maintenance control office, coordinating repair with suppliers. If a vendor does not respond, AT&T will place follow-up calls to determine the status of the problem and escalate the situation on behalf of the SDN user.

Also, AT&T net design specialists will analyze a network every three months to determine if the user should make any changes. In any event, the SDNCC provides each user with a quarterly analysis of its SDN performance.

If the percentage of calls completed using SDN falls below 80% or if trunking causes call blockage of at least 5%, AT&T will suggest corrective actions. Users can request lower thresholds.

Additionally, AT&T will send SDN billing specialists to user sites in addition to providing billing services from its SDNCC.

SDN Assurity Plus costs $750 a month, which covers all network sites. But firms that sign three-, four-, six- or nine-year contracts and commit to more than 15 million minutes a year of usage receive a $750 monthly credit that can only be used to buy SDN Assurity Plus, so the service is essentially free.

Under the third service, SDN Watch, AT&T will provide alarm surveillance on T-1s used to access SDN and equipment connected to the links. The SDNCC will use various net management systems to catch T-1 line problems before an outage occurs and to identify and resolve problems with on-site equipment.

As part of the SDN Watch service, AT&T provides coordinated vendor maintenance for equipment problems that affect SDN. As with SDN Assurity Plus, when an outage occurs as the result of an equipment problem, the SDNCC acts as the maintenance control office, coordinating equipment repairs with vendors.

SDN Watch costs $150 a month per T-1 access pipe.

All three services are in controlled introduction and will be generally available in May. ◻

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